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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
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PROCESSING AND QUALITY STUDIES OF SHRIMP HELD IN REFRIGERATED SEA WATER AND ICE

Part 1 - Preliminary Observations on Machine-Peeling Characteristics and Product Quality

By Jeff Collins*

ABSTRACT

Preliminary information is given on (1) the peeling characteristics of shrimp held in refrigerated sea water, (2) the leaching effect on shrimp of the washing action of the machine peeler, and (3) the effect of certain holding and processing variables on the quality of the canned product.

BACKGROUND

Two processors at Wrangell, Alaska, installed mechanical peelers in the winter of 1957-58, thus introducing to Alaska a mechanized process for shrimp canning. Along with these developments, industry expressed interest in the refrigerated-sea water system as a method for holding the shrimp prior to processing.

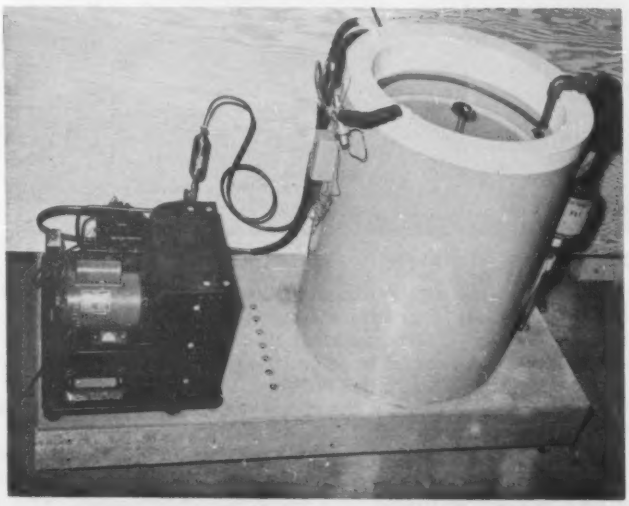

Fig. 1 - Portable laboratory refrigerated-sea water unit.

Considerable literature is available detailing the characteristics of the refrigerated-sea water system for holding fish. This generally indicates that there are considerable advantages inherent in the system for certain fish. However, only limited information (Higman and Idyll 1952; Higman, Idyll, and Thompson 1953; Roach and Harrison 1954) has been published on the holding of shrimp.

The literature indicates that the advantages of the system for holding shrimp may include (1) a greater freedom at sea to fish more distant grounds, (2) less crushing and breakage, (3)

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reduced labor costs, both on the vessel and at the plant, and (4) a safety factor to the plant operation in that a more consistent and economical processing schedule can be maintained. Before the potential advantages of the system could be evaluated, it was first necessary to determine whether shrimp held in refrigerated sea water would mechanically peel satisfactorily, since no large-scale production of the small shrimp is feasible in Alaska without the aid of the mechanical peeler.

The primary objective of the work reported here was to investigate the peeling characteristics of pink shrimp held in refrigerated sea water. Secondary objectives were to make a preliminary study of (1) the changes in the composition of the shrimp due to the leaching action of the water used in machine peeling and (2) the effect of refrigerated sea water on black discoloration of the canned shrimp.

PEELING CHARACTERISTICS

In the investigation of peeling characteristics, tests were carried out using a portable laboratory refrigerated-sea water unit in a commercial processing plant in Wrangell.

EQUIPMENT AND METHOD OF PROCESSING: In this subsection, refrigerated sea water is defined, and the tank that was used for holding the refrigerated sea water, the machine for peeling the shrimp, and the method of processing them are described. The normal plant procedure for holding the shrimp in ice is also given.

Fig. 2 - Shrimp being removed from an aging bin prior to machine-peeling.

Refrigerated Sea Water: Refrigerated sea water is a watery solution for holding fish or shellfish at about 30° F. It consists of a water-cooling medium, a tank to hold it, and a source of refrigeration. Since "refrigerated sea water" has been applied to several variations, the standard system and holding conditions described in this and subsequent papers is defined as follows: Refrigerated sea water (RSW) is the system in which an artifically-prepared solution of 3-percent (by weight) sodium chloride (canner's grade) dissolved in potable water is held in a tank constructed of an inert material and maintained at 30° ± 1° F. by means of mechanical refrigeration, suitable circulation of brine, and suitable insulation. Shrimp is held at a 1 to 1 ratio of shrimp to brine unless otherwise indicated. This ratio is optimum for shrimp in that it allows the brine to submerge the shrimp and only enough excess for proper circulation.

Holding Tank: The portable laboratory holding tank used (fig. 1) was constructed by coating the inside of a 55-gallon steel drum with white Fiberglass-Fiberlay. Copper tubing (100 feet in length and $\frac{1}{2}$ inch in diameter) was tightly wrapped on the outside of the drum and sealed to it with a thermomastic. The drum was then insulated with 3 inches of glass wool and covered with sheet metal. The refrigeration was supplied by a $\frac{3}{4}$-horsepower compressor with Freon 12 passing through an

expansion valve. The brine was circulated from the bottom center of the drum (false bottom with screened outlet) in polyvinylchloride pipe ($\frac{3}{4}$ inch in diameter) through a 1/8-horsepower magnetic circulator and back into the top of the drum through a perforated peripheral spreader pipe located just under the surface of the brine. The unit had a working capacity of 200 pounds of refrigerated sea water and 200 pounds of shrimp.

Fig. 3 - Shrimp in the process of being machine-peeled.

Icing Procedure: The shrimp are normally unloaded at the plant on the same day that they are caught. For optimum machine-peeling, such shrimp require a controlled aging period to release the meats from the shells prior to peeling. Aging is accomplished by layering the shrimp with flake ice in 4 by 8 foot wooden bins to a depth of about 3 feet. After 40 to 48 hours, the shrimp are transferred from the bins to the machine peeler.

Peeling Machine: The particular peeling machine used was a Model A peeler manufactured by the Peelers Company.

Processing: After the shrimp were machine-peeled, the meats dropped onto a continuous stainless-steel woven belt and passed through a covered steam box for 90 seconds. The meats, after being given this precook, passed through a rotating tunnel blower, where loose shell was removed, and onto a table for final inspection prior to seaming and retorting.

EXPERIMENTAL PROCEDURE AND RESULTS: Pink shrimp (Pandalus sp.) were used, since they are the species that make up the bulk of the shrimp that are machine-peeled in Alaska. In this study on machine peeling, three experiments were performed.

Experiment 1: Three hours after being caught 200 pounds of pink shrimp were placed in refrigerated sea water and held for 18 hours. These shrimp, although of excellent quality and easily peeled by hand, did not peel properly by machine, since the shells had not released from the meats sufficiently.

Experiment 2: The shrimp were held in refrigerated sea water for 40 hours. After this length of time, the shrimp were still of excellent quality, were easily peeled by hand, and were peeled satisfactorily by machine.

Experiment 3: The shrimp were held for 40 hours in 6-percent brine (Roach and Harrison 1954). Although these shrimp did not appear to be markedly different from those in the previous run, the operator of the machine found that the shrimp peeled slightly better. It was his opinion that shrimp held for 40 hours in either refrigerated sea water (as defined here) or in 6-percent brine would peel satisfactorily in the machine given enough shrimp to adjust the machine properly.

LEACHING ON PEELER

Since the shrimp were sprayed with a large volume of water during the peeling operation (fig. 3), it was of interest to determine the extent of leaching of certain soluble constituents under these conditions. For this study, (1) fresh hand-peeled shrimp, (2) shrimp held in refrigerated sea water for 40 hours and then hand-peeled, and (3) shrimp held in refrigerated sea water for 40 hours and then machine-peeled were frozen for later analysis. These analyses were for total chloride, total nitrogen (Association of Official Agricultural Chemists 1955), and total volatile base (Stansby, Harrison, Dassow, and Sater 1944).

Table 1 - Change in Certain Shrimp Constituents as a Result of Holding Shrimp in Refrigerated Sea Water (RSW) and Peeling Them by Machine

Treatment of Sample	Total Chloride Content	Total Volatile Base	Total Nitrogen Content
	As % NaCl	Mg.N/100 g.	Percent
Fresh, hand-peeled shrimp . . .	0.5	-	-
Shrimp held 40 hrs. in RSW then hand-peeled	1.4	7.2	3.0
Shrimp held 40 hrs. in RSW then machine-peeled	0.7	6.3	2.6

The data are shown in table 1. They indicate that leaching did occur when shrimp were machine-peeled. As can be noted from the table, for example, most of the salt that was absorbed when the shrimp were held in refrigerated sea water for 40 hours was leached out during the subsequent peeling operation. Both the total volatile base and the total nitrogen content also decreased as a result of machine-peeling.1/

BLACK DISCOLORATION

The black discoloration of canned shrimp has been a problem of long standing. It is generally accepted that the use of poor-quality shrimp will result in a discolored product. From the published literature on the use of refrigerated sea water for the holding of fish, it was expected that shrimp so held would be of better raw quality than when held in ice (time of holding being the same). It also seemed possible that discoloration might be less for shrimp held in refrigerated sea water. Therefore, preliminary tests were carried out during the peeling experiments, previously described, in order to determine the relative effect that aging in ice or aging in refrigerated sea water would have on black discoloration.

In these experiments, shrimp held either in ice (the normal plant procedure) or refrigerated sea water were processed both with the addition of citric acid prior to retorting, which was the normal plant procedure, and without the addition of citric acid but with the addition of brine. The acid, if used, was added by flooding the cans, prior to seaming, with 4.8-percent sodium chloride brine containing 0.36-percent citric acid. All cans were then stored at room temperature and subsequently examined at various intervals up to 7 months.

The darkening characteristics for the cans processed without citric acid are arranged in order of increasing tendency to darken as follows:

1/ It might be argued that the data are artifacts caused by moisture uptake rather than a true leaching. Moisture, of course, is absorbed by the meats, but if the "loss of constituents" is caused only by moisture uptake, then the ratios of the initial to the final values of the three analyses would be constant and equal to each other. Since this was not the case, leaching must also have occurred.

Holding Conditions	Relative Darkening
Iced shrimp, 40 hours aging, good quality	very slightly dark
RSW shrimp, 18 hours aging, 3-percent brine, good quality	slightly dark
RSW shrimp, 40 hours aging, 3-percent brine, good quality	moderately dark
RSW shrimp, 40 hours aging, 6-percent brine, good quality	moderately dark
Iced shrimp, 40 hours aging poor quality	very dark

In the samples processed with the addition of citric acid, the acid prevented darkening except for one ice-held sample that was of borderline freshness.

QUALITY

Although observations in the course of the present work indicated that holding shrimp in refrigerated sea water yielded a product of satisfactory quality, the work was carried out under favorable conditions that may not always be obtainable. Quantitative data are therefore needed regarding the effect of holding and processing variables before the relative usefulness of refrigerated sea water can be evaluated for Alaska shrimp. Accordingly, data on such factors will be presented in subsequent reports in this series of articles.

CONCLUSIONS

1. Pink shrimp machine-peeled satisfactorily after being held 40 hours in refrigerated sea water containing either 3-percent or 6-percent brine.

2. Salt, total volatile base, and total nitrogen contents of the shrimp were reduced by the leaching action of water during machine-peeling.

3. When shrimp were canned without the addition of citric acid, black discoloration increased with (1) loss in quality of ice-held shrimp, (2) time of holding in refrigerated sea water, and (3) increased brine concentration. Adding citric acid prevented darkening except for one ice-held sample of borderline freshness.

4. Before the relative usefulness of the refrigerated-sea water system can be evaluated for Alaska shrimp, quantitative data are needed regarding the quality of the product as affected by holding and processing variables.

Note: The author wishes to express his appreciation to Messrs. B. Engdal and H. Sundberg for their helpful discussions and for making the facilities of the Harbor Seafoods Company at Wrangell, Alaska, available for these experiments.

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BRAIDED SYNTHETIC TWINES AND THEIR USE IN THE NEW ENGLAND TRAWL FISHERY

By Michael Ruggiero*

BACKGROUND

The chemical revolution, which has brought about many changes in many industries, has also reached the fishing industry. Its effects can be seen on the decks and in the enginerooms of every vessel of the fishing fleet as well as in every fishery shore installation in the form of improved products, supplies, and materials. The introduction of synthetically-produced or improved fibers is only one part of this major revolution, but a part which will become increasingly important in the future.

Development of practical applications for synthetic fibers was speeded greatly by World War II research, but development of applications useful to the fishing industry was slower, carried out by trial and error, and conducted largely by using materials originally developed for other applications. In the New England trawl fishery, in spite of the recent trend toward increased use of synthetics, natural fibers still provide the bulk of the raw material for twine and webbing manufacture.

Synthetic twines were first introduced to the fishing industry shortly after the war by netting manufacturers who spun and twisted synthetic filament into conventional-type twines. These twines proved to be excellent trawl materials owing largely to their increased strength and longer life as compared with natural twines; but many trawl-fishermen felt that the added advantages were outweighed by the added capital expenditure required, and most webbing made from spun and twisted filament has been used by nontrawl segments of the industry--particularly by seine and gill-net fishermen. It has become apparent to trawl fishermen, however, that there were definite advantages to be gained from the use of synthetic twines, provided the initial cost of the twines could be reduced to compare more favorably with that of the natural-fiber twines currently in use.

DEVELOPMENT OF THE BRAIDED-TWINE INDUSTRY

Trawl fishermen soon found a partial answer to their quest for less expensive synthetics in the 3- to 4-fathom braided cords which could be obtained from surplus Armed Forces parachutes, air-drop cargo nets, and other devices. Application of these surplus synthetic braids to trawl construction was the beginning of a new approach to the manufacture of trawl twines and webbing. The braided material, although too thick for extensive use in nontrawl segments of the fishing industry, was ideal for construction of New England-type trawls. It, however, could not be handled by conventional net-making machinery. Net sections had to be made by hand and were primarily limited to cod-end sections by the size of braid available. New and better, but equally inexpensive, sources for braided synthetics were needed.

Waste material from tire, upholstery, fabric, thread, and firehose manufacturers was tried next. This waste material was hand-braided into a number of sizes of twine suitable for all sections of typical New England trawls, but little attention was paid to blending the yarns or to the uniformity of the final braid and the resulting product did not prove to be as practical as that obtained from Government surplus. Greater selectivity in waste buying and blending was necessary.

Emphasis was then placed on the use of conventional net-making machinery to replace hand labor. This increased the necessity for obtaining a relatively unvaried

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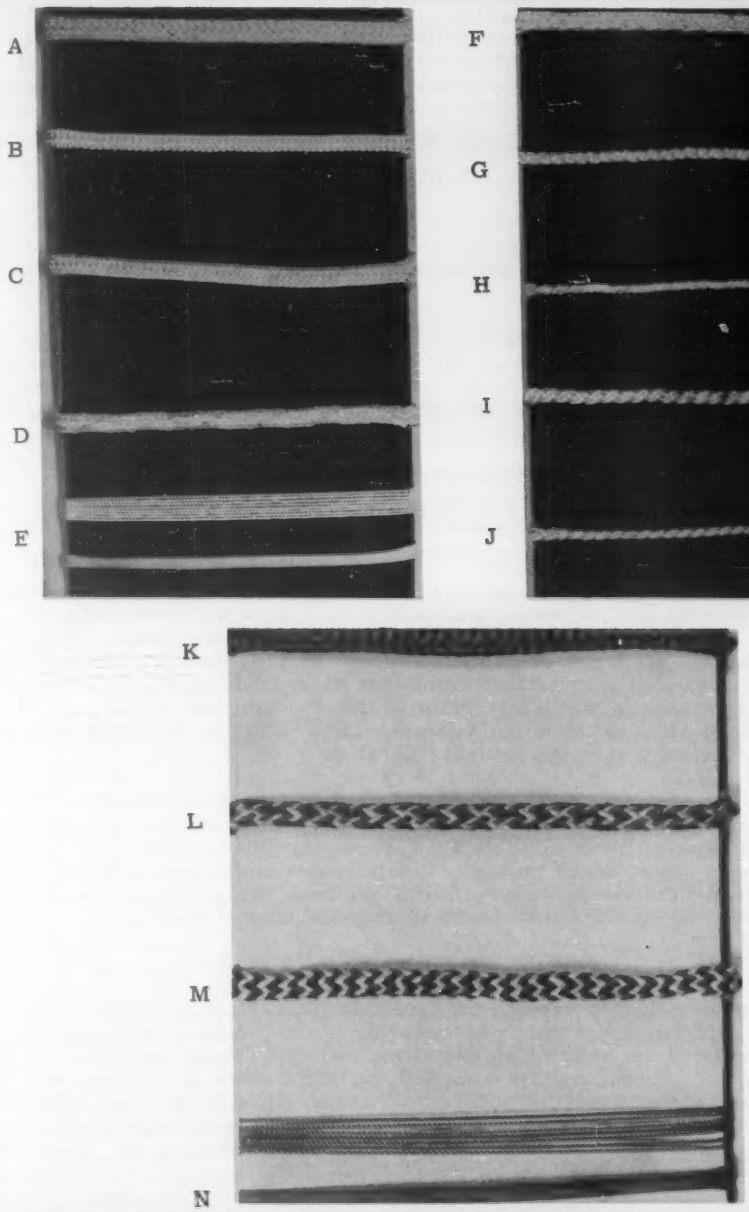


Fig. 1 - Synthetic braids and twines in common use aboard trawlers of the New England Fleet: (A) Westerbeke's No. 2 heavy nylon braid; (B) Lambeth Rope Company heavy nylon braid; (C) Westerbeke's No. 1 medium nylon braid; (D) Levine Marine Supply heavy nylon braid; (E) Armed Forces surplus Para-cord No. 550; (F) Levine Marine Supply Heavy nylon-Dacron braid; (G) Grimsby's heavy Terylene twisted twine; (H) Grimsby's light Terylene twisted twine; (I) Linen Thread Company No. 200/3 twisted nylon twine; (J) Linen Thread Company No. 400/3 twisted nylon twine; (K) Armed Forces surplus cargo netting No. 1,000 nylon braid; (L) Levine Marine Supply heavy Dacron-nylon braid; (M) Levine Marine Supply heavy braid; (N) Armed Forces surplus "Para-cord" No. 400 nylon braid.

source of waste supply for the manufacture of uniform braid. A suitable waste supply was found to be available from the tire-cord industry. Tire-cord manufacturers use high-quality synthetics; their specifications are rigid; and lot samplings are performed routinely to determine adherence to standards for several important qualities. An abundant supply of cord, rejected for tire manufacture, but suitable for twine manufacture is one result of the strict adherence to rigid specifications designed to maintain tire quality.

PRESENT CONDITION OF THE BRAIDED-TWINE INDUSTRY

At the present time, braided netting suppliers: (a) purchase waste tire cord; (b) braid the cord and knit it into webbing by machine; (c) cut the webbing into trawl sections. The only exception to that procedure occurs with heavy braids for cod ends. These are still knit by hand.

Compared with spinning, braiding is a simple operation, and the cost of braids made from manufacturing waste is far below the cost of twisted twine made from original synthetic filament. In many cases the cost of the finished braid produced by the braid suppliers is less than the cost of the original raw filament used by the tire-cord manufacturers.

CONSTRUCTION

Two general methods of manufacture are employed by the twine industry--braiding and spinning.

Braiding consists of weaving the assembled fibers, known as yarn or strands, so that they are crossed and recrossed and each strand passes alternately over and under the others. The tightness of the braid is determined by the number of picks per inch[1/] and by the tension placed on the strands. Full utilization of the strength of the fibers is not realized with braided twine, but the method combines economy with the added strength of synthetic materials so that the finished product provides a stronger twine than was available using natural-fiber twines of equivalent weight at a cost that approaches that of the natural fibers.

Spinning consists of drawing out a ribbon of parallel fibers and twisting this ribbon into a cylinder. The fibers become tightly compressed against one another during this process and the resulting friction between the fibers holds them in place when the structure is pulled under tension. Compactness is determined by the degree of twist. The structure resulting from this process, being cylindrical, possesses maximum attainable strength for the amount and kind of fiber used.

CHARACTERISTICS OF BRAIDED TWINES

Differences in construction result in differences in physical characteristics of the braided twine, and these determine the behavior of the twines in use, the degree of mesh contraction, and the wearing ability of the twines. The type of fiber, amount of twist in the plys or strands, and the compactness of the twine (picks per inch) can have wide variation and can result in different characteristics in the final product. The construction details of a commonly-used Armed Forces surplus braided twine and a braided twine manufactured specifically for the trawl fishery from tire-cord waste (fig. 2) are given in table 1.

The Armed Forces surplus braided cord chosen for comparison was originally designed for cargo netting, to be used in dropping supplies by parachute. It is made up of filaments plyed together with a very low twist. These are then plaited together in a loose fashion to form a very flexible braid capable of high-shock absorptive

1/Picks per inch: A textile term used in describing compactness or fineness of cloth or cord. Defined as the number of times a specific strand enters the braid in a measured inch of that braid.

ability, high elastic recovery, and great strength. Cod ends made from this material have a longer useful life than those made from any of the other twines obtained. The braid, being flexible, and the component filaments being so formed and positioned that they are almost parallel to one another, causes the outer filaments to curl when broken, thereby protecting the inner filaments from further damage. Breaking of the outer filaments does not weaken the braid below a useful level because of the excessive initial strength of the braid material.

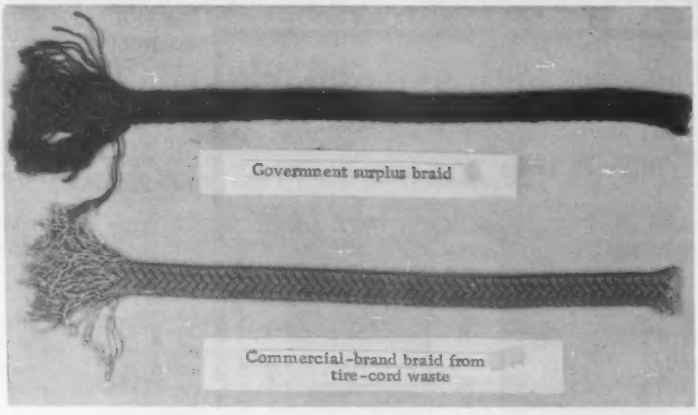


Fig. 2 - Representative braided nylon twines described in table 1.

Because of the looseness of the braid ("low number of picks per inch"), the surplus air-cargo netting braid often becomes infiltrated with sand and dirt. This often causes the braid to swell to a maximum of twice the original diameter thereby contributing greatly to a decrease in mesh size in those sections where the braid is subjected to the greatest wear and exposure to substrate (table 2 and fig. 3).

Table 1 - Construction Details of Two Representative Braided Nylon Twines

Construction Characteristic	Surplus No. 1,000 Cargo Cord	Commercial-Brand Cord Manufactured from Tire-Cord Waste
Yards/pound	43.83	38.89
Ends	96	48
Ends/carrier	6	3
Carriers	16	16
Denier/filament/ply	220/84/4	840/140/3
TPI Z-twist in single ply	1.26	12.10
TPI S-twist in 4-ply	3.38	-
TPI S-twist in 2-ply	-	9.9
Picks/inch	8.08	9.0

Braids made from tire-cord waste are made from yarns having a very high twist in both the filament plys and the yarns because of the extreme compactness required by tire manufacturers. The commercial braid made from tire waste and chosen for comparison with the surplus air-drop cargo-netting braid, is tightly plaited (containing a high number of picks per inch) and is therefore more compact but less flexible than the surplus material. It more nearly resembles natural-fiber twine in those characters. This braid tends to maintain a relatively stable mesh size, not being susceptible to the degree of swelling noted in surplus braid. In use, the commercial braid tested reacted in a manner similar to natural-fiber twine and had considerable stretch when subjected to heavy stress and wear.

Table 2 - Mesh Variation Experienced with Trawl Sections Made of Government-Surplus Synthetic Braids (After-Use Variation)[1/]

Net No.	Construction Material	Avg. Original Mesh Size	No. Trips Made	Avg. Mesh Size After Use
1	Double Parachute Cord No. 550D	4.39 inches	19	4.31 inches
2	" " "	4.41 inches	15	4.31 inches
3	" " "	4.39 inches	15	4.32 inches
4	Nylon Cargo Net Cord No. 1,000	4.63 inches	27	4.23 inches
*5	" " "	4.32 inches	23	3.61 inches
*6	" " "	4.39 inches	17	3.28 inches
*7	" " "	4.38 inches	20	3.90 inches
8	" " "	4.50 inches	25	4.01 inches
*9	" " "	4.26 inches	40	3.84 inches
*10	" " "	4.45 inches	28	3.60 inches

1/Figures used were obtained from certification records and after-use data gathered during 1954-58.
*Net still in use at time of measurement.

After-use measurements of two cod ends were made for comparative purposes. One cod end was constructed of Government surplus cargo netting. The other was made of a commonly-used commercial tire-cord waste braid. The results (fig. 3) showed that the meshes of the cod end made of Government surplus material contracted most in the area of the greatest wear and strain whereas the cod end made from the commercial braid contracted most in an area where the wear and strain were less than maximum.

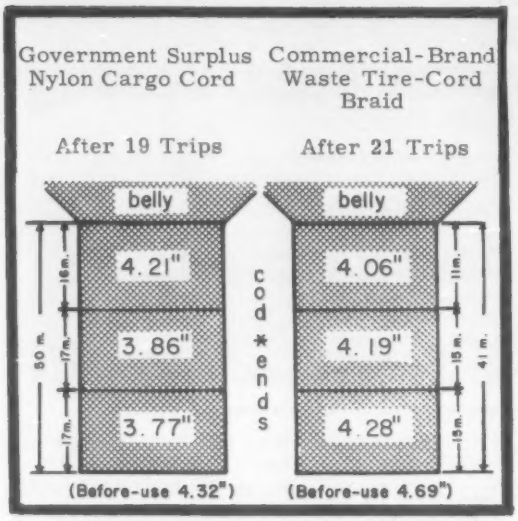


Fig. 3 - After-use measurements of two cod ends constructed of the materials described in table 1. Figures in mesh sections show internal mesh sizes after use. Figures below sections (before-use figures) refer to entire cod-end. Note that the area of maximum contraction varies with the construction material. (m = meshes)

ADVANTAGE OF SYNTHETIC TWINES IN THE NEW ENGLAND TRAWL FISHERY

Synthetic fibers most commonly used in the New England trawl fishery are nylon, dacron, and rayon. Chief advantages of these fibers result from their ability to withstand the effects of micro-organism attack, their high tensile strength, and their low level of moisture absorption. The synthetic fibers lose a greater amount of strength through knotting than do natural fibers, but even with this loss, their strength generally remains above the unknotted strength of natural fibers.

The most efficient gear is one which: (a) has the lowest initial cost; (b) has the longest useful life; (c) has the lowest maintenance costs; and (d) catches the most fish--is the most effective device for capture.

Initial Cost: The initial cost of a section of synthetic trawl webbing is still higher than that of an equivalent-size section of natural-fiber webbing, but the costs are more nearly equal now than in the past.

Useful Life: The useful life of synthetic webbing is many times longer than the useful life of natural-fiber webbing largely owing to the susceptibility of the natural-fibers to bacterial-induced rot. This longer life could contribute to a substantial saving in gear bills.

Maintenance Costs: Maintenance of synthetic fibers is simpler and usually cheaper than maintenance of natural-fibers and consists mainly of preventing overlong exposure to sunlight. The need to dry the nets frequently is done away with when using synthetics.

There is also less need for extensive repair when using synthetics as they are more resistant to the force of heavy catches and the blows and snagging effects often encountered in everyday operation.

Effectiveness: The effectiveness of synthetic-fiber gear compared with natural-fiber gear has been the subject of considerable debate. In the gill-net fishery many cases of increased effectiveness have been cited for synthetic nets. Less supporting evidence is available for trawl gear, but it must be assumed that synthetic trawls are, at the very least, as effective as natural fiber trawls.

USE OF BRAIDED TWINES AND WEBBING IN THE NEW ENGLAND TRAWL-FISHING INDUSTRY

Synthetic twines and braids are still used on only a restricted scale in the New England trawl fishery owing to the hazards involved in the trawling operation. In "hard-bottom" fishing for cod and haddock, the bottom sections of the trawls are often subjected to "tear-ups" that may carry away whole sections of webbing--synthetic or natural-fiber--making a complete trawl of synthetic webbing somewhat impractical. Top wings, squares (overhangs), and cod ends are therefore often made of synthetic webbing, but natural-fiber webbing is used frequently for the more vulnerable parts of the net--the lower wings and bottom belly (table 3).

In the flounder fishery, conducted primarily on sand bottom, synthetic webbing is more suitable than natural-fiber webbing because it can withstand the effect of greater loads of sand without tearing up. "Sanding up" is a serious source of net loss with natural-fiber nets.

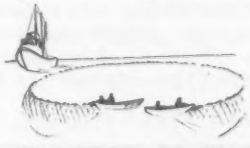
Table 3 - Fibers Used for Trawl Construction in the New England Fishing Fleet in 1958 (Based on a Survey Conducted in May 1958)

Trawl Section	Number of Vessels Using		
	Manila Twine	Cotton Twine	Synthetic Twine
Cod ends	26	-	73
Squares	32	30	37
Top wings	29	30	40
Bottom wings	32	56	11
Top belly	32	44	23
Bottom belly	32	54	13

Experience has shown that it is often preferable to use cotton or manila for lacing and hanging nets to avoid the distortion of a section of webbing which otherwise often results following a hang-up. Use of manila- or cotton-lacing or hanging twine creates a weak point which carries away before serious damage is done to the webbing.

Trawls constructed wholly of 3/16-inch braided nylon cord were recently used in trawling over bottom considered too rough for natural-fiber nets in recent trial-trawling for red snapper in the Gulf of Mexico by the exploratory fishing vessel Silver Bay, under charter to the U. S. Bureau of Commercial Fisheries. Performance of the gear was considered satisfactory with only minor tear-ups recorded and with negligible loss of webbing.

Synthetic fibers will continue to be used in the New England trawling industry in the future, and, as their cost decreases, they will undoubtedly contribute to a greater and greater extent to the over-all efficiency of that fishery. Their place has been assured by industry acceptance of the results of practical application.



SILOS FOR FISH MEAL STORAGE

In Norway, it has been found that bulk storage of fish meal in grain silos is more practicable and cheaper than storage in bags. Distribution costs are also reduced. The meal should be stirred occasionally, which also ensures thorough mixing resulting in a meal of uniform quality. It seems preferable to divide the silos into smaller storage cells (Informationen über die Fischwirtschaft des Auslandes, June/July 1958).

DEVELOPING INSPECTION AIDS FOR SALMON AND HALIBUT

In the development of quality standards for fishery products, the U. S. Bureau of Commercial Fisheries' technological laboratories have recognized the need for selecting criteria which reflect actual differences in quality use of the product. Factors such as dehydration, packaging voids, size and number of pieces, trimming defects, and number of blemishes are easily described and tabulated in the standard or a supplementary manual for the inspectors.

In preparing inspection manuals for the frozen halibut steak standard and the proposed standard for frozen salmon steaks, the Seattle Technological Laboratory of the Bureau found that descriptions of defects relating to appearance, color, or shape were insufficient for orientation and guidance of inspectors. After considering possible use of models, sketches, and illustrative material, color photographs of steaks typifying these factors were selected for study and trial. Two sets of 5" x 7" color prints, numbering 10 prints in a set for each standard, were prepared to illustrate criteria for appearance, workmanship, discoloration, blemishes, and other visual factors considered in the standard. Frozen steaks demonstrating the various defects were selected by laboratory personnel; photographs were taken and the prints prepared by a professional photographer. The cost for each set of prints was a fraction of the cost estimate for preparation of wax or plastic models.

The use of color, proper lighting, and modern color-print techniques yielded a photographic print which reproduces visual factors and defects in a most realistic manner.

To date, experience in the laboratory and the use of the color photographs for demonstration purposes have indicated considerable value for their use as an inspection aid. Ease of use and portability are outstanding assets of the photographs in addition to their reasonable cost. Negatives are stored for future duplication when needed. The experience of both the film manufacturer and the photographer indicate good stability of the dye pigments used in the prints even if subjected to considerable sunlight during use.

It is believed that further studies over a longer period will enable the laboratory to select graded samples demonstrating defects at various score levels for photographic reproduction. Thus, for those factors in which visual identification and comparison are important, the laboratory can assist the inspector in uniform application of criteria through the help of modern photographic techniques.

DEVELOPMENT OF NEW STANDARDS FOR PACIFIC COAST FISH

Towards the end of 1959, the Seattle Technological Laboratory of the Bureau of Commercial Fisheries has completed the exacting work in the preparation of three new standards applicable to Pacific Coast fish. These standards are to be promulgated in the weeks to come and cover frozen salmon steaks, frozen cod fillets, and

frozen ocean perch fillets. The salmon steak standard includes all species of Pacific salmon and was developed after frequent consultation with the industry and a grading survey of 391 samples of commercially packaged salmon steaks.

Both the cod and ocean perch fillet standards were initiated by the Technological Laboratory, Gloucester, Mass. These preliminary drafts were revised after close cooperation with the Seattle laboratory to include the applicable Pacific Coast species. Interchange of personnel, samples, and laboratory data between the two laboratories in addition to consultation with industry in each area has assured the development of unified standards best suited to the needs of processors, distributors, and consumers.

BACTERIOLOGICAL STANDARDS FOR FROZEN FOODS UNDER STUDY

Bacteriological standards for frozen foods were discussed in an October 1959 meeting of officials and members of the industry organization--the National Association of Frozen Food Packers and representatives of the Association of Food and Drug Officials of the United States--primarily Federal and State officials connected with regulatory and control agencies.

A number of reports were presented on recent developments in bacteriological methodology and statistical treatment of bacteriological data. Four agencies, including the U. S. Bureau of Commercial Fisheries, reported on data obtained from bacteriological examination of plant-line samples of various frozen foods. There was a lengthy discussion following the papers, centering around such problems as: (1) Does the frozen food industry really need bacteriological standards? (2) What type of standard, that is, which of the various "indicator" organisms such as total plate count, coliforms, E. coli, enterococci, or staphylococci, best meet the requirements of a bacteriological standard? (3) What are fair and workable limits for each of these classes of microorganisms? And (4) what are the best test methods to recommend for each of these indicator organisms?

It is not surprising, considering the controversial nature of the subjects under discussion, that no definite decision was reached regarding the use of bacteriological standards for frozen foods. It was recommended that more data be collected by all the interested groups and that another meeting be held to further consider the problems involved.

FISH OILS HAVE UNIQUE FATTY ACID COMPOSITION

Research on the fatty acid composition of fish oils has not been carried far enough by chemists of the U. S. Bureau of Commercial Fisheries to give more than a very general idea as to species variation. Actually most fish have a reasonably similar composition with respect to fatty acid distribution such that the following information on fatty acid distribution of "fish in general" probably applies to most species. Whereas there is probably a relatively small difference in composition of fatty acids in fish from one species to another (a difference the Bureau has only begun to investigate), there is a huge difference in fatty acid composition of fish oils as contrasted to that of oils from vegetable or animal sources.

Most fish oils contain 20- to 30-percent saturated and 70- to 80-percent unsaturated fatty acids. At first consideration this may appear to be less unsaturation than in common vegetable oils (e.g., corn oil, which contains 85-percent un-

saturated vs. 15-percent saturated fatty acids). The place where fish oils are outstanding is in the large proportion of highly unsaturated fatty acids. Thus about half of the 70 to 80 percent of the unsaturated fatty acids of fish oils contain 3, 4, 5, or 6 double bonds, whereas corn oil contains only 1 and 2 double-bonded fatty acids. Usually 20 percent or more of the total fatty acids of a fish oil have 5 or 6 double bonds.

Since it is the total unsaturation (which is proportional to the number of double bonds present) which governs the cholesterol depressant effect of an oil, the fish oils have a much higher potential action in this respect than do the vegetable oils.

As has been indicated, there are enough results on variation in composition of fatty acids in different species of fish to give a good appraisal of the different species. Species of herring, mackerel, salmon, menhaden, mullet, sardines, anchovies, and tuna generally contain between 5 and 25 percent oil in the meat with a high variability from sample to sample even of the same species. Probably the degree of unsaturation of the variety of sardine canned from California pilchard is the greatest, but it is not known if it is sufficiently higher than that of the others to make any material difference. Most tuna oils are also highly unsaturated, but canned tuna usually contains added vegetable oil which more than compensates for any advantage that tuna oil otherwise might offer. Of the different species of salmon, pink salmon--one of the least expensive varieties--has a high degree of unsaturated fatty acids.

Most of the common species of fish have relatively low oil content in the range of 0.5 percent to 5 percent. Such species as cod, haddock, halibut, flounder, sole, and ocean perch, as well as the various shellfish are in this category. Such species are valuable in making up diets high in protein and low in oil. What oil does come from the fish is highly unsaturated, though the amount may be so small as to have little or no significant cholesterol-depressant effect.

Bureau research to learn the fatty acid composition of different species of fish is in its early stages. In the next few years it is expected that information will be available to provide more complete answers on the fatty acid composition of many varieties of fish.

NEW PRODUCTS FROM FISH OILS

During 1959, research has been carried out at the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries on the development of new products from fish oils along with investigations relative to determining the different quantities of the component fatty acids found in commercial fish oils. Major attention was given to two products, namely, monoglycerides and acetoglycerides. Gas-liquid chromatography was the principal technique investigated with respect to fatty-acid composition.

MONOGLYCERIDES AND ACETOGLYCERIDES FROM FISH OILS: Monoglycerides and acetoglycerides are prepared from animal fats and vegetable oils and are used in such commercial products as shortenings, emulsifiers, and plasticizers. Such compounds prepared from fish oils may have unique properties in themselves such that they may prove to be valuable in similar commercial products.

Experimentally, it was shown that fish-oil monoglycerides could be easily prepared by a chemical reaction involving the triglyceride oil, glycerine, and a catalyst. An investigation was made to determine the optimum reaction time for the conditions of the process in order to give a high yield of the product, and at the same time to minimize the possible destruction of the high degree of unsaturation present in the original oil.

Acetoglycerides were prepared from the monoglycerides. Results gave little evidence for loss of unsaturation due to the conditions of the reaction. The acetoglycerides were found to be much more amenable to purification by distillation than were the monoglycerides. The acetoglycerides were very light in color and substantially free of odor. This was also true for the monoglycerides.

PURIFICATION OF FISH OILS: The principal objections to the commercial use of fish oils by most industries are that "fishy" odors are often imparted to the final product, such as in paints and soaps, and that the products are often unstable and are easily oxidized. The latter is a result of the chemical make-up and reactivity of fish oils.

An investigation was carried out on the applications of liquid-liquid extraction and molecular distillation of menhaden oil in an effort to produce an oil that possesses improved qualities. Results showed that menhaden oil could be greatly improved from the standpoint of odor and color. Work is continuing to determine the stability of the refined oil.

FATTY ACID COMPOSITION BY GAS-LIQUID CHROMATOGRAPHY: Gas-liquid chromatography is a method of analysis, which involves the vaporization of mixture components in a liquid-partitioning column, and chromatographing or separating the components of the mixture by carrying them through the column in an atmosphere of an enert gas, such as helium. The column is packed with solid particles supporting a nonvolatile partitioning liquid. Separation is accomplished on the basis of differences in partition coefficients for each separate component.

As a result of recent advances in gas-liquid chromatography, a tool is now available for the first time for the complete separation and quantitative analyses of the constituent fatty acids in fish oils. Work during the past year has included the adaptation of certain published techniques to the analyses of major commercial fish oils. The major part of this work was devoted to determining the most satisfactory conditions for the operation of our chromatographic equipment, in order to resolve the some 35 or more individual component acids. This work is continuing.

REFRIGERATED SEA WATER LENGTHENS STORAGE LIFE OF WHITING

Whiting kept in refrigerated sea water have a much longer storage life than when kept in ice, according to tests made by the Gloucester Technology Laboratory of the U. S. Bureau of Commercial Fisheries. The meat of the whiting, although pleasant tasting, is soft-textured and is apt to lose its fresh quality rapidly even when stored in ice. This change is a serious matter to the processing plant whenever it is necessary to hold large quantities of the fish prior to processing.

Because refrigerated sea water has proved successful as a medium for holding other species of fish on the Pacific coast, the Laboratory studied the suitability of this method for holding whiting.

The tests revealed that whiting held in sea water at 30° F. was kept fresh longer than when stored in ice. An expert taste panel declared that 30° F. sea water kept whiting at a high quality level about twice as long as the same fish iced.

This improvement in the handling of a low-cost, abundant species is important to both industry and the consumer.

TRENDS AND DEVELOPMENTS

American Samoa

American Samoa Tuna Landings, 1958-59

Species	December		Jan.-Dec.	
	1959	1958	1959	1958
	(1,000 Lbs.)			
Albacore	2,655	2,452	22,474	22,251
Yellowfin	238	613	4,017	5,537
Big-eyed	63	53	982	1,060
Skipjack	1	-	15	-
Total	2,957	3,118	27,488	28,848

Note: Most of these tuna were landed by Japanese vessels; a small amount by South Korean vessels.

Byproducts

U. S. FISH MEAL, OIL, AND SOLUBLES PRODUCTION, 1959:

During 1959, fish meal and scrap production (based on information from firms which accounted for 91 percent of the 1958 production) amounted to 275,000 short tons--a gain of 48,000 tons as compared with 1958. The marine-animal oil yield amounted to 24.4 million gallons--2.4 million gallons above 1958.

Imports of fish meal and scrap during 1959 totaled 133,000 tons--33,000 tons more than in 1958. A sharp increase of 82.8 percent in the imports of fish solubles also occurred from 1958 to 1959. Exports of fish and fish-liver oils totaled 144.5 million pounds during 1959--a gain of 50.5 million pounds as compared with 1958.

Note: See Commercial Fisheries Review, April 1959, p. 37.

U. S. Production of Fish Meal, Oil, and Solubles, 1958-59

Product	Unit	1959 Preliminary	1958 Revised
		(Quantity)	
Meal and Scrap:			
Herring:			
Alaska	Tons	8,440	6,888
Maine	"	2,946	3,389
Menhaden	"	222,009	158,074
Sardine, Pacific	"	3,170	10,756
Tuna and mackerel	"	20,806	25,311
Unclassified	"	18,025	22,516
Total	"	275,396	226,934
Oil, Body:			
Herring:			
Alaska	Gallons	1,717,784	1,553,346
Maine	"	233,433	207,094
Menhaden	"	20,504,635	17,064,818
Sardine, Pacific	"	222,803	740,806
Tuna and mackerel	"	564,018	627,171
Other (including whale)	"	1,175,786	1,783,988
Total	"	24,418,459	21,977,223
Fish solubles	Gallons	29,894,692	20,980,221
Homogenized-condensed fish	Pounds	57,238,000	50,552,000

Note: Preliminary data based on information from firms which accounted for 91 percent of the 1958 production. The total production of fish meal in 1958 amounted to 248,140 tons.

California

AERIAL CENSUS OF COMMERCIAL ABALONE FISHING CONTINUED:

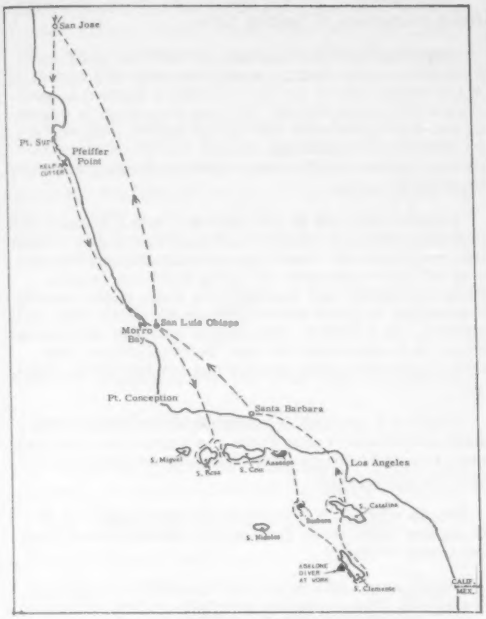
Airplane Spotting Flight 59-23-Abalone: The shoreline from Monterey to Morro Bay and the Channel Islands of Santa Rosa, Santa Cruz, Anacapa, Santa Catalina, Santa Barbara, and San Clemente was surveyed from the air on December 5, 1959, by the California Department of Fish and Game Twin Beechcraft to locate specific areas of commercial abalone diving.

Storm warnings had just been posted from Pt. Sur to the Mexican Border and gusts up to 70 m.p.h. in the Oxnard-Ventura region were reported.

From Monterey south to Morro Bay no diving boats were observed. A kelp cutter was operating below Pt. Sur in the cove at Pfiffers Point and several schools of unidentified fish were seen south of Pt. Sur.

Clearance from the military could not be obtained to fly over San Miguel Island but it was certain that no diving activity was in progress there because of the rough weather.

Among the Channel Islands, one diver was seen operating at San Clemente.



Airplane Spotting Flight 59-23-Abalone (December 5, 1959).

A kelp cutter was operating at Santa Barbara Island. Kelp growth along the mainland and among the islands had increased considerably since the flight on September 1959.

Note: Also see Commercial Fisheries Review, January 1960, p. 28, and February 1960, p. 29.

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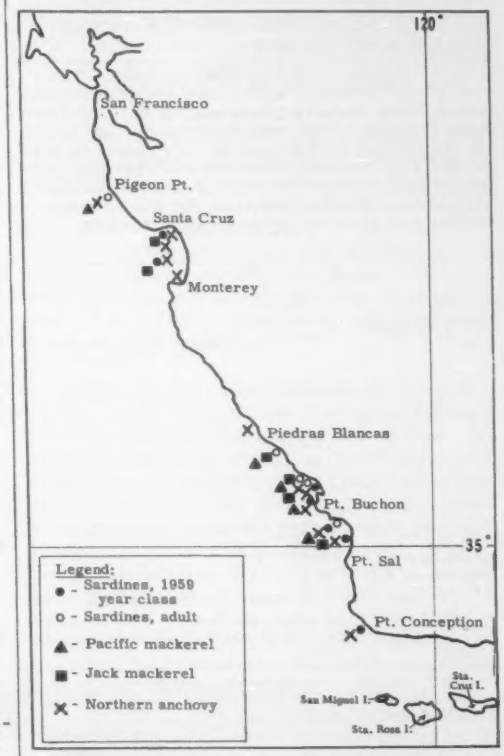
PELAGIC FISH POPULATION SURVEY OFF COAST OF CENTRAL CALIFORNIA CONTINUED:

M/V "Alaska" Cruise 59A9-Pelagic Fish: The coastal waters off central California from Point Reyes to Santa Barbara were surveyed (October 21-November 9, 1959) by the California Department of Fish and Game research vessel Alaska to sample young sardines for determining relative abundance and distribution resulting from 1959 spawning. Other objectives were to sample adult sardines, Pacific mackerel, jack mackerel, and anchovies; to transport live fish to San Francisco for behavior studies being conducted by the California Academy of Sciences; to collect live sardines for genetic studies conducted by the U. S. Bureau of Commercial Fisheries laboratory at La Jolla; and to collect specimens as requested by other investigations.

A total of 79 light stations was occupied. Sardines were collected at 11, anchovies at 12, jack mackerel at 6, and Pacific mackerel at 5.

A total of 390 miles was scouted between stations. Only 11 schools were sighted, all unidentified. Although not densely schooled, large numbers of Pacific saury and atherinid "smelt" were observed between most stations from Point Reyes to San Simeon Bay. South of San Simeon Bay, "smelt" and California bonito were seen in moderate numbers.

Unfavorable winds were encountered during the first half of the trip, but the weather from October 31 until the completion of the cruise was ideal. The almost total absence of wind and rough seas made it possible to achieve thorough coverage of the area from San Francisco to Point Conception.



M/V Alaska Cruise 59A9-Pelagic Fish (October 21-November 9, 1959).

Adult sardines (180-235 mm.) were sampled at 5 stations from Pigeon Point to San Luis Obispo Bay and young sardines (68-137 mm.) were taken at 7 stations from Santa Cruz Harbor to just north of Point Conception.

Airplane Spotting Flight 59-21-Pelagic Fish: The inshore area from the Mexican border to Piedras Blancas Point was surveyed from the air (November 16-17, 1959) by the Department's Cessna 180 (3632C) to determine the distribution and abundance of pelagic fish schools.

Although weather and visibility conditions were fair to good, only 20 anchovy schools were seen.

Sixteen thin schools were found close to shore between the Standard Oil dock at Morro Bay and Oro Flaco Lake. The remaining 4 schools were off southern California, 2 small ones at the end of the Huntington Beach pier and 2 large ones, accompanied by many birds and two gray whales, one mile south of Pt. Dume.

In addition, a large school of porpoises was seen between Point Dume and Point Mugu.
Note: Also see Commercial Fisheries Review, Feb. 1960, p. 27.

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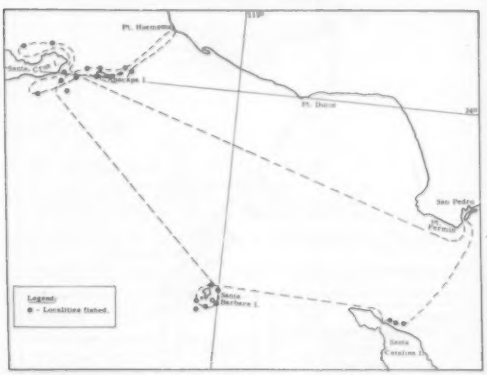
ROCKFISH STUDIED OFF SOUTHERN CALIFORNIA COAST:

M/V "Nautilus" Cruise 59N5-Rockfish: The area around Anacapa Island, east end of Santa Cruz Island, Santa Barbara Island and off Isthmus Cove, Santa Catalina Island, was surveyed by the California Department of Fish and Game's research vessel Nautilus to obtain vermilion rockfish (Sebastodes miniatus), one of the most important market species in southern California, for life history studies, and to obtain other rockfish species.



M/V Nautilus Cruise 59N5-Rockfish (November 9-18, 1959).

Good weather during the entire cruise permitted a maximum of fishing time.

Although several baskets of set-line gear were available, most fishing was done with rod and reel. Many areas had to be tested before desirable species were encountered. On one occasion, a basket of set-line gear with 100 baited hooks was set in 85 fathoms off Anacapa Island, but the catch was poor considering the time spent in setting and retrieving the gear.

Depths from 16 to 108 fathoms were fished. A fair abundance of small- and medium-sized vermilion rockfish was found in approximately 32 fathoms off the north side of Santa Barbara Island. Both immature and mature fish were taken making it possible to determine the size at which they first mature. In addition, scales and otoliths were saved from each specimen for age determination, and sets of ovaries were preserved for fecundity studies.

In all, 15 species of rockfish were taken. The most important, aside from the vermilion rockfish, were bocaccio (S. paucispinis) and whitebelly rockfish (S. vexillaris).

Ocean whitefish (Caulolatilus princeps), up to 22 inches long, were frequently taken in nearly all the areas fished.

There appeared to be vast quantities of pelagic red crabs, Pleuroncodes planipes, in the areas fished off southern California. Most of the fish had been feeding heavily on them. In many cases, tiny kelp scallops, Chlamys latiaurata, were attached to these pelagic red crabs.

Canned Fish

UNITED STATES PACK, 1958-59:

The United States pack of fish and shellfish for human consumption declined in 1959 as a result of sharply re-

United States Pack of Certain Canned Fish Products, 1959 and 1958

Product	1959 1/		1958	
	Standard Cases	Pounds	Standard Cases	Pounds
Tuna:				
California	10,700,000	-	11,001,422	-
Washington and Oregon	1,280,000	283,006,000	1,227,071	277,130,641
Other	2,415,000	-	1,865,608	-
Total	14,395,000	283,006,000	14,094,101	277,130,641
Salmon:				
Alaska	1,770,800	84,998,400	2,971,297	142,622,256
Pacific Coast States	692,400	33,235,200	760,663	36,511,824
Total	2,463,200	118,233,600	3,731,960	179,134,080
Sardines:				
Maine	1,750,000	40,950,000	2,099,959	49,139,041
Pacific	755,000	33,975,000	2,222,586	100,016,370
Mackerel, Jack and Pacific	595,000	26,775,000	404,425	18,199,125
Anchovies	3,000	93,750	53,735	1,679,219
Shrimp, South Atlantic and Gulf	745,000	11,175,000	808,314	12,124,710

1/Preliminary.
Note: Standard cases represent: tuna - 48 No. $\frac{1}{2}$ tuna cans (solid pack 7 ozs., chunks $6\frac{1}{2}$ ozs., flakes and grated 6 ozs. net); salmon - 48 1-lb. cans (16 ozs. net); Maine sardines - 100 $\frac{1}{4}$ -oil cans ($3\frac{3}{4}$ ozs. net); Pacific sardines - 48 1-lb. cans (15 ozs. net); mackerel - 48 1-lb. cans (15 ozs. net); anchovies - 100 cans (5 ozs. net); shrimp - 48 cans (5 ozs. net).

duced packs of salmon, Maine and Pacific sardines, anchovies, and Gulf shrimp. The pack of canned tuna (14,395,000 standard cases) established a new record.

Data were available on January 11, 1960, for items which accounted for 87 percent of the 1958 pack canned for human consumption. The case pack of these items in 1959 was down 13 percent, while the net weight of the pack was down 20 percent.

Cans--Shipments for Fishery Products, January-November 1959

Total shipments of metal cans for fishery products during January-November 1959 amounted to 109,026 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 117,322 tons in the same period of 1958. Shipments of metal cans declined 13.3 percent from October to November 1959 and were down by 17.7 percent from November 1958 to November 1959.

As of the end of November, the canning of Maine sardines and Pacific salmon was about over for the 1959 season and packs were below normal. The California sardine pack at end of November 1959 was running about 65 percent under the 1958 pack. The lighter packs of those canned fish items were partially responsible for the drop in the shipments of metal cans from January-November 1959 as compared with the same period in 1958.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Central Pacific Fisheries Investigations

TILAPIA CULTURE AS SOURCE OF LIVE BAIT FOR TUNA FISHERY SUCCESSFUL:

As an important part of a program to supplement the short supply of natural tuna bait (nehu, principally), the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries completed in December 1959 the two-year operation of a tilapia-rearing plant on Maui Island. This plant represented a cooperative venture in which the Laboratory operated the plant, a commercial fishing firm constructed the plant, and the Hawaiian Board of Agriculture and Forestry provided policing, fencing, and other services in connection with the project. The operation of this plant has served two objectives: (1) to determine the economic feasibility of rearing tilapia as a live-bait species for skipjack tuna fishing; and (2) to supply a source of bait for sea tests of this species.

Tests of the effectiveness of tilapia as live bait were made during both years aboard some of the skipjack vessels. In 1958 the average catch using tilapia was 46 pounds of skipjack per pound of tilapia used, while in 1959 the catch of skipjack was an average of 92 pounds per pound of tilapia. The comparable catch of skipjack, using nehu, was 50 pounds of skipjack per pound of nehu in 1958 and 57 pounds per pound of nehu in 1959. Undoubtedly some of the higher returns per pound of bait expended in 1959 should be attributed to the fact that, individually, the "season" fish available to the fishermen during 1959 were substantially larger than was true of the fish available during the same period in 1958. However, the relatively higher catch per pound of tilapia bait as compared to that obtained with nehu indicates that with increased familiarity with the behavior of tilapia and with some modifications of fishing techniques, tilapia bait was employed with much greater efficiency in 1959 than in 1958 for catching skipjack.

The operation of the plant during 1959 was improved through the utilization of other experiments conducted at the Kewalo Basin Laboratory on optimum sex

ratios and fish densities for a maximum rate of reproduction. In addition, the water in the brood tanks at Maui was aerated and, for one tank, heated during the winter and spring months of the year.

The total production of tilapia during 1959 exceeded that for 1958 by approximately 300,000 fry (1,293,457 as compared with 1,074,076). These production figures averaged 1,078 fry per female in 1959 and 724 fry per female in 1958.

While undoubtedly a lower concentration of fish, heating, and aeration contributed to the higher production in 1959 as compared to that of 1958, the spring of 1959 was a warm, sunny one while that of 1958 was wet and cloudy with somewhat lower than normal temperatures. Additionally, a higher grade of feed for the fish was used in 1959 as compared to that used in 1958.

Crabs

MARYLAND SAMPLES WINTER BLUE CRAB POPULATION FOR CLUES TO FUTURE HARVESTS:

To help unravel the mystery of the widely fluctuating blue crab harvest in Maryland, a team of biologists from that State's Chesapeake Biological Laboratory surveyed upper Chesapeake Bay waters late in January 1960.

The Laboratory's research vessel Cobia dredged for hibernating crabs between the Patuxent River and the Bay Bridge, as one phase of a long-range effort to predict crab harvests and possibly protect future crab populations.

The vessel's dredging runs crisscrossed the Bay in a sampling pattern designed to discover if crabs have highly specialized preferences regarding hibernating quarters. The area was sampled systematically in order to see if an adequate population-sampling technique could be devised. It is already known by scientists that all the crabs that will be caught in Chesapeake Bay in a given summer are also present during the preceding winter; there is no significant outside source.

The blue crabs in winter are practically motionless; their activity almost ceases when water cools to 41° F., and the bottom temperature is about 40° F. late in January.

Most of the hibernating crabs, as shown by preliminary runs on the Patuxent River, were either large ones (six inches or wider) which escaped last summer's harvest, or were the very small (from $\frac{1}{4}$ to $1\frac{1}{2}$ inches) which hatched last summer and which will enter the harvest for the first time late next summer as $3\frac{1}{2}$-inch soft crabs.

Other points noted from the Patuxent River trials by the biologists (subject to further verification) are: (1) crabs apparently prefer to winter on bottoms of mud or oyster shells; and (2) most crabs taken with the dredge so far have been found in 10 to 20 feet of water. Practically none were found at or below 50 feet, although this depth is a common crab habitat in the lower Bay.

Maryland crabbers and packers will benefit considerably if harvests can be predicted even six months in advance. In the past, the harvest has been as low as 12 million pounds (in 1941) and as high as 32 million pounds (1950). Such fluctuations often leave the unsuspecting industry and market in grave difficulty.

The dredging program will also help in many other phases of crab research, including study of causes of good or poor crops, effect of harvesting on total numbers, and migration patterns. Many people feel that harvesting pressure controls the future supply, but there is some evidence that environmental factors are usually far more potent.

Maryland's crab research is conducted in cooperation with the Virginia Fisheries Laboratory, and fits into the broad program of necessary blue crab research established by the Atlantic States Marine Fisheries Commission.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-DECEMBER 1959:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.8 million pounds (value $876,000) of fresh and frozen fishery products were purchased in December 1959 by the Military Subsistence Supply Agency. This exceeded the quantity purchased in November by 23.0 percent and was 8.9 percent above the amount purchased in December 1958. The value of the purchases in December 1959 was higher by 22.9 percent as compared with November, but 0.8 percent less than for December 1958.

During January-December 1959 purchases totaled 22.7 million pounds (valued at $11.6 million)--increase of 0.6 percent in quantity, but down 9.5 percent in value as compared with 1958.

Prices paid for fresh and frozen fishery products by the Department of Defense in December 1959 averaged 49.4 cents a pound, unchanged from November, but 4.8 cents less than the 54.2 cents paid during December 1958. The average price of 51.3 cents paid for all purchases of fresh and frozen fishery products in 1959 was down sharply from the 1958 average of 57.1 cents a pound. This was due mainly to lower prices for nearly all fishery products in 1959.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, December 1959 with Comparisons

QUANTITY				VALUE				AVERAGE PRICE	
December		Jan.-Dec.		December		Jan.-Dec.		Jan.-Dec.	
1959	1958	1959	1958	1959	1958	1959	1958	1959	1958
(1,000 Lbs.)				($1,000)				(¢ Per Lb.)	
1,775	1,630	22,651	22,511	876	883	11,624	12,850	51.3	57.1

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during December 1959. In 1959, purchases of canned tuna were down by 37.2 percent and canned salmon purchases were lower by 67.5 percent as compared with 1958. However, canned sardine purchases in 1959 increased 315 percent from 1958.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, December 1959 with Comparisons

Product	QUANTITY				VALUE			
	December		Jan.-Dec.		December		Jan.-Dec.	
	1959	1958	1959	1958	1959	1958	1959	1958
	(1,000 Lbs.)				($1,000)			
Tuna	741	918	3,698	5,884	315	486	1,672	1/
Salmon	-	-	1,085	3,336	-	-	737	1/
Sardine	25	142	1,051	253	11	19	177	1/
Totals	766	1,060	5,834	9,473	326	505	2,586	1/

1/Unavailable.

Fisheries Loan Fund

FISHERIES LOANS APPROVED OCTOBER 1-DECEMBER 31, 1959:

As of December 31, 1959, a total of 664 applications for fisheries loans totaling $21,060,664 had been received since the loan fund program was started. Of these, 355 ($8,356,095) had been approved, 230 ($6,741,309) had been declined or found ineligible, 53 ($2,314,156) have been withdrawn, and 26 ($2,626,133) are pending. Several of the pending cases had been deferred indefinitely at the request of the applicants. Sufficient funds are available to process new applications when received.

The following loans had been approved between October 1 and December 31, 1959:

New England Area: Alexander Smith, New Bedford, Mass., $18,800.

South Atlantic and Gulf Area: John M. Snedeker, St. Petersburg, Fla., $5,000; Roderick M. McCall, Jr., McIntosh, Ga., $2,900; Warren H. Rector, Awendaw, S.C., $20,000; and Barney Lee Sanders, Aransas Pass, Tex., $19,000.

California: Ernest & Elvera Montiero, San Diego, $64,000; John D. & Warren K. Simpson, San Diego, $3,550; and August W. Angellsen, San Pedro, $3,260.

Pacific Northwest (All Washington): Delbert B. O'Hara, Bellingham, $2,100; Robert Myette, Bellingham, $7,522; James W. McCormick, Olympia, $3,000; Gunnar Abelsen, Port Angeles, $3,000; John V. Linvog, Seattle, $10,000; and John Preece, Seattle, $5,100.

Alaska: Norton B. Sorrels, Juneau, $3,000; Erick W. Lindeman, Ketchikan, $14,000; and Adolph M. Nelson, Ketchikan, $10,000.

Hawaii

HIGHER SKIPJACK TUNA LANDINGS IN 1959 BEAR OUT PREDICTION BY BIOLOGISTS:

On the basis of early 1959 variations in selected oceanographic conditions in Hawaiian waters, a prediction was made by biologists of the U. S. Bureau of Commercial Fisheries during the month of March 1959 that the 1959 total landings of Hawaiian skipjack would be average or better than average. With inclusion of incomplete December 1959 statistics, the partial landings for 1959 totaled 11,429,350 pounds. Total average annual landings for the years 1948 to 1958 were 9,800,000 pounds. During only two years, 1951 with 12,900,000 pounds and 1954 with 14,000,000 pounds, did the landings at Honolulu exceed those for 1959.

The higher-than-average 1959 catches were made by a reduced fleet. Twenty sampans were in operation as compared to 28 for 1951 and 27 for 1954.

The Hawaiian skipjack tuna fishery is seasonal, with the bulk of the annual catch being taken between May and September. Normally, a large percentage of the skipjack caught during those months weigh 18-22 pounds, with small fish 4-8 pounds and large fish 28-32 pounds. The off-season (November to April) catches average 4-8 pounds per fish. During the 1959 season, the 24-31 pound group dominated the catch as compared with the expected 18-22 pound fish. During December 1959, a month well into the off-season, the dominant group in the catch continued to be larger fish, 20-22 pounds, as compared with the anticipated 4-8 pound skipjack.

Maine Sardines

CANNED STOCKS, JANUARY 1, 1960:

Distributors' stocks of Maine sardines totaled 235,000 actual cases on January 1, 1960--33,000 cases or 12.0 percent less than the 268,000 cases on hand January 1, 1959. Stocks held by distributors on November 1, 1959, amounted to 296,000 cases, and on July 1, 1959, totaled 176,000 cases, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on January 1, 1960, totaled 843,000 standard cases (100 3¾-oz. cans), a decrease of 48,000 cases (5.0 percent) as compared with January 1, 1959. Stocks held by canners on November 1, 1959, amounted to 1,001,000 standard cases.

The 1959 pack (from the season which opened on April 15, 1959, and ended on December 1, 1959) was about 1,751,000 standard cases as compared with 2,100,000 cases packed in the 1958 season. The pack for the 1957 season totaled 2,117,151 standard cases.

The total supply (pack plus carryover on April 15, 1959) at the canners' level as of January 1, 1960, amounted to

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, January 1, 1960, with Comparisons1/

Type	Unit	1959/60 Season		1957/58 Season				
		1/1/60	11/1/59	7/1/59	6/1/59	4/1/59	1/1/59	11/1/58
Distributors	1,000 Actual Cases	235	296	176	197	254	268	312
Canners	1,000 Std. Cases2/	843	1,001	422	272	474	891	1,037

1/Table represents marketing season from November 1-October 31.
2/100 3¾-oz. cans equal one standard case.

2,171,000 standard cases, or 10.8 percent below the total supply of 2,434,000 cases as of January 1, 1959. Canners' shipments from April 15, 1959, to January 1, 1960, amounted to 1,328,000 cases as compared to 1,543,000 cases for the same period a year earlier.

On January 1, 1960, a total of 52,000 cases of canned Maine sardines were in the hands of retail multiunit organizations--22.1 percent of the stocks in distributors' hands.

Marine Conservation

SEA LIFE CONSERVATION PROGRAM DISCUSSED AT WILDLIFE CONFERENCE:

The sea has been aptly called an unknown jungle but great potentials exist for the control, cultivation, and concentration of the harvest thereof, the Director of the U. S. Bureau of Commercial Fisheries told the Northeast Wildlife Conference January 11, 1960. The conference met in Providence, R. I.

After touching briefly on the history of commercial fisheries in this country and reviewing some of the current operations and results of recent research, the speaker plunged into the problems and possibilities of practicing conservation in the oceans. The principal concepts of the talk were:

New concepts in conservation are developing in the world's marine laboratories with interesting emphasis on the "weather" of the sea, the possibility of creating artificial "upwellings," the "farming" of bays and estuaries, the development of brackish water areas for fish culture, and the challenge of the nations of the world, one to another, for the fruits of the "rich ocean pasturages."

Marine scientists are recognizing that the important fisheries are not the only things which exist beneath the surface of the ocean. These fish live in complex communities and compete and struggle for their niche in their marine environment just as do land plants and animals. Studies of the environmental factors affecting the life and death of these marine communities seem to be essential for future conservation of the marine fisheries. Ocean "weather," that is, the conditions which exist below the surface, is a variable which affects the habits and life of all ocean fisheries. Conservationists must understand throughly the ocean environment and the various anomalies which affect the fishes living there.

Vertical currents of water, called "upwellings" which occur naturally in the vicinity of the equator, bring up minerals and nutrients from the ocean depths to the surface and provide the basis for the start of the food chain for ocean life. Even now some oceanographers are considering the possibility of heating deep areas in the open ocean, or even heating localized areas, and creating artificial upwellings which would transfer the nutrients and minerals from the depths to the surface.

International fisheries and the accompanying problems are increasing in importance. As nations turn to the sea for food and recreation, there is bound to occur the question of ownership of the resources, the problem of which nations shall share in the resources, and how the sharing can be done. Not only have nations like Russia and Japan established huge fishing fleets which seek out and harvest rich crops from the sea, but they are also developing large and efficient oceanographic research vessels. This is a challenge which the United States must meet to insure food and recreation for our citizens in the future.

Relative to the farming of bays and estuaries, the United States has a problem of its own to solve. In Asia and in some of the countries of southern Europe where conditions are favorable, this type of fish culture is rather well developed. The possibilities of intensive sea farming similar to that practiced on land is, therefore, not an impractical concept. But in this country, the demand for estuarial areas for industrial purposes or for subdivisions, or for some other purpose, is already threatening this area of conservation. This definite trend can not be stopped by negative action but facts are not at hand for affirmative action. Therefore we need to get on the job on an emergency basis for developing the facts which, in turn, will be the basis for a sound conservation program in those areas.

Much has been learned and much must still be learned on the biology of fish, upon making intelligent harvests, and the economic and physical sciences involved if the nations of the world are to make the sea produce even a portion of its great potential.

The speaker also reviewed the work of many of the international commissions which now exist and showed their conservation successes in spite of what scientists concede to be only a fraction of the knowledge which man should have in formulating a conservation program for the various oceans.

New England

LANDINGS OF FOOD FISH LOWER, INDUSTRIAL FISH HIGHER IN 1959:

The principal New England fishing ports in 1959 produced less food fish but more industrial fish than the previous year, according to a preliminary report from the U. S. Bureau of Commercial Fisheries' Market News office at Boston, Mass. Total food-fish landings were 466 million pounds, 5 percent less than in 1958, while industrial-fish landings totaled 228 million pounds, 6 percent more than the previous year. The total ex-vessel value of $42 million for all 1959 landings was about the same as the previous year.

Landings at Boston, Gloucester, New Bedford, Provincetown, Woods Hole, Mass., Portland, Rockland, Me., Point Judith, R. I., and Stonington, Conn., represent about 75 percent of all New England landings.

The New England fishing fleets operated at capacity in 1959 and landed about 33,400 trips of all types as compared with 32,600 trips the previous year. Good relations between fishermen and vessel owners continued in 1959. Some vessels improved their physical condition with funds

obtained through the Bureau's Fishery Loan Fund program.

Gloucester was the leading food-fish producer in 1959 with 154 million pounds. Next was Boston with 111 million, New Bedford 70 million, Portland 56 million, Rockland 42 million, Provincetown 15 million, Point Judith 11 million, Woods Hole 4 million, and Stonington 3 million pounds.

Gloucester also had the largest drop in landings of food fish from the previous year--14 million pounds. Boston followed with a decrease of 13 million pounds.

Ocean perch continued as the leading food species landed at New England ports in 1959, as 136 million pounds were brought to the docks, 12 million pounds less than in previous years. Gloucester landings in 1959 of ocean perch were 18 million pounds less than in 1958, while Portland and Rockland, Me., had heavier landings.

Haddock landings totaled 96 million pounds in 1959 and was the next leading food species. This was also under the 1958 total by 7 million pounds. Boston, the leading haddock producer with 70 percent of the total, handled 13 million pounds less than in 1958.

Next in volume was whiting with a total of 82 million pounds, 75 percent of which was landed at Gloucester. The 1958 total was also 82 million pounds at all ports.

Total landings of the other important food species at the New England ports in 1959 were: flounders 50 million pounds, cod 30 million, and pollock 21 million pounds. Pollock landings were down 7 million pounds while cod and flounder landings in 1959 were close to the 1958 total.

Sea scallops, the most valuable of the New England ocean food species, set a new record volume in 1959. A total of 20 million pounds was landed, 90 percent of this at New Bedford, the Nation's leading scallop port.

The industrial-fish fleets at New England's ports produced 228 million pounds of fish for use in animal food and fish meal in 1959. This was 13 million pounds more than in 1958 due to more plentiful supplies of menhaden in North Atlantic waters. Poor conditions in the fish-meal market in 1959 precluded an even greater increase. Some fish-meal plants shut down before the end of the year due to the heavy inventories and poor market for meal destined for poultry feed. Point Judith continued as the leading industrial-fish producer with a total of 91 million pounds; trailing were Gloucester with 75 million, and New Bedford with 38 million pounds.

Stocks of frozen New England-produced fishery products were in very good supply in warehouses throughout the Nation as 1959 ended. Domestic production was augmented by imported products that continued to arrive at a record pace. As a result of the heavier inventories, wholesale prices of the major New England-produced fishery products in 1959 were lower than in the preceding years.

The fish-stick and fish-portion industry continued at at a good pace in 1959. Although these products were made almost exclusively from foreign-produced blocks of groundfish fillets, the industry did provide full employment at many processing plants, and provided business to many related industries. The fish-portion production increased considerably as this item is becoming very popular in the institutional market. In 1959 the U.S. Customs Court ruled that imported fish

blocks were dutiable at a lower rate than heretofore, giving an additional advantage to foreign fish block producers.

Replacement of fishing vessels continues to be one of New England's most serious problems. New construction was almost negligible as vessel operation has not always been profitable in recent years, due to ever-increasing costs of operation. Some New England fishing vessels were sold to Canadian interests in 1959. Federal aid in the form of a construction subsidy was sought. Both houses of the 1959 Congress passed bills to provide this aid, but adjournment came before a Conference committee could be appointed to work out a compromise. It is hoped by the industry that 1960 will see Federal legislation in this form to aid the New England groundfish industry reach a more favorable economic position to meet foreign competition.

Oysters

VIRGINIA BIOLOGISTS DISCOVER CAUSE OF OYSTER MORTALITIES IN CHESAPEAKE BAY:

Scientists at the Virginia Fisheries Laboratory, Gloucester Point, have found a micro-organism not known before in oysters from Virginia waters. This organism, possibly a member of a group of parasitic one-celled animals called Sporozoans, was discovered in Delaware Bay less than two years ago by a scientist of Rutgers University. It is believed to be the primary cause of extensive losses of oysters in Delaware Bay since 1957. It poses no public health problems.

During 10 years of oyster-mortality studies, biologists at Virginia's marine laboratory have refined the tray method of observation on natural beds and collected what is probably the most detailed and longest set of records on mortalities of oysters in existence. This backlog of information has proven invaluable in evaluating unusual oyster losses. One important cause of mortalities, the fungus Dermocystidium, has been studied fairly thoroughly; however, other agents have received inadequate attention until recently.

A more intensive surveillance of Virginia waters was begun in 1959 following the Delaware catastrophe of 1957 and 1958. Trays were established in most major oyster-producing areas early in 1959 and were examined frequently throughout the year to detect mortalities of oysters.

During 1959, two Laboratory biologists collected and examined thousands of oysters in a search for causes of mortalities. Approximately 4,000 oysters were examined individually for the well-known and long-established fungus-killer of oysters--Dermocystidium. Eight hundred of these have been used to prepare stained slides for microscopic search for other parasitic organisms. The new organism was found in these slides and its similarity to the Delaware Bay "Sporozoan" has been confirmed by the Rutgers University biologist.

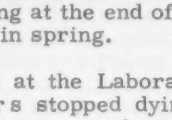
The new unnamed organism has been found widely distributed in lower Chesapeake Bay--York River, Mobjack Bay, Chesapeake Bay proper, and both the bay and ocean sides of the Eastern Shore of Virginia. Examination of oysters preserved in earlier years is underway to determine how long the new organism has been in Virginia waters. It is possible that it has been in Chesapeake Bay for many years and will not cause serious trouble.

An unexplained spring loss was followed by heavy late summer and fall losses in lower Chesapeake Bay in 1959, but it appears most of the warm season losses were caused by the old oyster nemesis--Dermocystidium. The new organism has been found on the oceanside of the Eastern Shore where Dermocystidium is absent but no losses have occurred there since July 1959.

Although the new organism seems to have played a minor role in deaths of oysters in 1959, its reported importance in Delaware Bay provides a vivid warning of what could happen in Chesapeake Bay. James River oysters shipped by the Laboratory of New Jersey and planted in Delaware Bay in June 1959 were 60 percent dead by December 1959.

Oystermen have been advised to keep a close watch on their beds through the year beginning at the end of winter and particularly in spring.

Scientists at the Laboratory state that oysters stopped dying at the end of October--as usual--and that no public health problems are involved either with the new organism or with Dermocystidium.



Shrimp

CALIFORNIA'S LANDINGS HIGHER IN 1959:

The 1959 California ocean shrimp landings totaled 1,777,874 pounds, an increase of 47,652 pounds over the 1958 record of 1,730,222 pounds, the California Department of Fish and Game reported on January 22, 1960. The 1959 record was made possible by increasing quotas in the Crescent City and Fort Bragg area, the Department's Director explained.

Area A (California-Oregon State line to Cape Mendocino) led all others with California landings of 1,317,972 pounds, plus about 400,000 pounds landed in Oregon. The 1958 California landings were 1.1 million pounds.

The average catch per fishing hour in Area A was 638 pounds for the entire season as compared with 501 pounds in 1958.

The Area A fleet operated out of Crescent City the entire season, chiefly off the Klamath River and Redding Rock, working a 20-mile stretch in depths ranging from 52 to 90 fathoms and averaging 65 fathoms.

Other area catches: Area B-1 (Cape Mendocino to Pt. Arena) a record 444,998 pounds was landed during the 1959 season as compared with 329,714 pounds in 1958. Rough weather and strong currents cut down the catch per fishing hour from 656 pounds in May to 464 pounds in June and to 222 pounds in July.

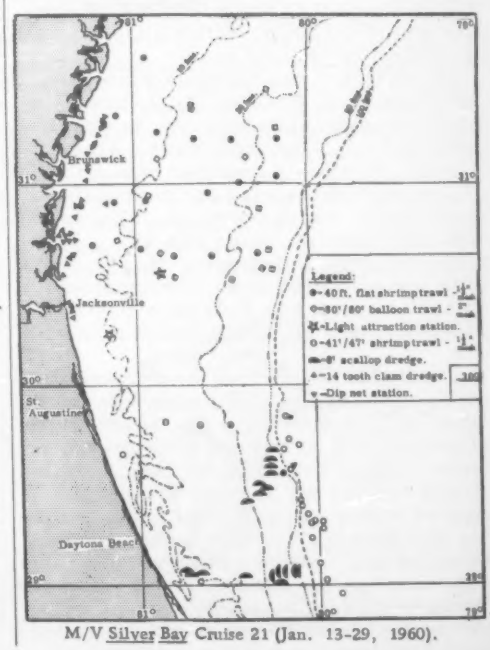
Area B-2 (Pt. Arena to Pigeon Point) failed to yield shrimp in 1959.

Area C (Pigeon Point to Pt. Conception) produced 14,904 pounds as compared with 87,949 pounds in the 1958 season.

South Atlantic Exploratory Fishery Program

COMMERCIAL BEDS OF SCALLOPS FOUND OFF FLORIDA EAST COAST:

M/V "Silver Bay" Cruise 21: Catches of commercial-size scallops by the U.S. Bureau of Commercial Fisheries chartered fishing vessel Silver Bay in 20 to 30 fathoms east of Cape Canaveral, Fla., indicate an extensive area with good possibilities for commercial-scale fishing. The January 13-29, 1960, cruise was the fourth in a series designed to explore the inshore and offshore areas along the South Atlantic Coast between North Carolina and Florida.



M/V Silver Bay Cruise 21 (Jan. 13-29, 1960).

A total of 18 tows was made with an 8-foot scallop dredge, with activities partially handicapped by heavy seas at the time. Considerable variation was evidenced in both the abundance and size of scallops taken. Catches as high as 7-10 bushels of mixed shells and live scallops were taken per 15-minute tow. The ratio of shells to live scallops was about five to one by weight. Generally, a single size group of medium-size scallops ($1\frac{1}{2}$-2 inches) were taken in the 10-15 fathom depth range, while two size groups, very small and large ($2\frac{1}{2}$-3 inches) marketable-size scallops, were taken in the 20-30 fathom depth range.

Other objectives of the cruise were to: (1) determine catch-rate data for species of fish suitable for use as pet food or for reduction out to the 25-fathom curve between Brunswick, Ga., and Daytona Beach, Fla.; (2) explorations for hard clams (Mercenaria species) along the 3-5 fathom depth range between Altamaha Sound, Ga., and the St. John's River, Fla.; and (3) to recheck royal-red shrimp fishing grounds previously located in the Florida stream along the 200-fathom depth curve between 29 and 30 degrees N. lat.

Exploratory Fishing for Industrial Fish: A total of 39 tows along east-west transects was made with a 40-foot, two-seam, balloon trawl; and a 40-foot flat trawl fished on a 25-fathom bridle with a single towing warp and six-foot chain doors; and an 80-foot, two-seam balloon trawl fished with two warps and eight-foot bracket doors. Catches up to 225 pounds per 1-hour tow of large (7-13 inch) vermillion snapper (Rhomboplites aurorubens) were made over typical snapper-type bottom in the vicinity of 30°39' N. lat. and 80°17' W. long. Only small catches of industrial fish were taken in the area fished with trawl nets.

Exploratory Fishing for Hard Clams: Thirty sets were made with a 14-tooth Fall River clam dredge. Sets were concentrated near inlets, and where possible on mud bottom. Typically, hard sand bottom was encountered and only 3 live clams were taken.

Test Fishing for Royal-Red Shrimp: A total of 16 3-hour tows was made with a 40-foot, two-seam balloon trawl to obtain samples of royal-red shrimp for biological studies. Small numbers of royal-red shrimp were taken in the 175-225 fathom depth range. Gear fouling and depth recorder difficulties caused some loss of fishing time and poor depth control.

Tuna

TAGGED BLUEFIN TUNA CROSS ATLANTIC:

For the past several years, personnel from the Woods Hole Oceanographic Institution have accompanied the U. S. Bureau of Commercial Fisheries' exploratory fishing vessel Delaware on various offshore tuna explorations in order to tag bluefin tuna and other pelagic species captured during long-line operations. As a result of these cooperative efforts, a bluefin tuna tagged from the Delaware on May 24, 1959, 325 miles east of Ocean City, Md., was caught during tuna-seining operations in the late summer of 1959, near Provincetown, Mass. The tag was recovered during canning operations.

In addition, the Woods Hole Oceanographic Institution reports 2 bluefin tuna tagged near No Man's Land, Mass., in July 1954, were captured during the summer of 1959 in the Bay of Biscay. According to French authorities, probably 8 more bluefin tagged by personnel of the Woods Hole Oceanographic Institution have been caught by French fishermen who failed to save the tags.

United States Fishing Fleet[1/] Additions

OCTOBER 1959:

A total of 34 vessels of 5 net tons and over were issued first documents as fishing craft during October 1959--a decrease of 21 vessels as compared with the same

1/Includes both commercial and sport fishing craft.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, October 1959

Area	October		Jan.-Oct.		Total
	1959	1958	1959	1958	1958
	(Number)				
New England	1	-	14	11	13
Middle Atlantic	1	1	11	12	13
Chesapeake	18	18	87	87	99
South Atlantic	2	12	71	122	135
Gulf	8	16	125	247	270
Pacific	4	7	88	103	112
Great Lakes	-	-	6	6	10
Alaska	-	1	31	31	31
Virgin Islands	-	-	-	1	1
Total	34	55	433	620	684

Note: Vessels assigned to the various areas on the basis of their home ports.

month of 1958. The Chesapeake area led with 18 vessels while the Gulf area was second with 8 vessels, and the Pacific was third with 4 vessels.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, October 1959

Net Tons	Number
5 to 9	22
10 to 19	5
20 to 29	4
30 to 39	1
40 to 49	2
Total	34

During the first ten months of 1959, a total of 433 vessels were issued first documents as fishing craft--187 less than in the same period of 1958. The number of vessels issued first documents in the Gulf area dropped 122 below the number reported for the first ten months of 1958.

* * * * *

NOVEMBER 1959:

Thirty-two vessels of 5 net tons and over were issued first documents as fishing craft during November 1959--4 less than in November 1958. The Chesapeake led all other areas with 13 vessels, followed by the Pacific with 7 vessels, the Gulf with 6 vessels, and the South Atlantic with 3.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, November 1959

Area	November		Jan.-Nov.		Total
	1959	1958	1959	1958	1958
	(Number)				
New England	1	1	15	12	13
Middle Atlantic	1	1	12	13	13
Chesapeake	13	6	100	93	99
South Atlantic	3	9	74	131	135
Gulf	6	12	131	259	270
Pacific	7	4	95	107	112
Great Lakes	-	3	6	9	10
Alaska	1	-	32	31	31
Virgin Islands	-	-	-	1	1
Total	32	36	465	656	684

Note: Vessels assigned to the various areas on the basis of their home ports.

A total of 465 vessels were issued first documents as fishing craft during the first eleven months of 1959--191 less than during the same period of 1958.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, November 1959

Net Tons	Number
5 to 9	21
10 to 19	3
20 to 29	4
30 to 39	1
50 to 59	1
80 to 89	1
110 to 119	1
Total	32

* * * * *

DECEMBER 1959:

A total of 14 vessels of 5 net tons and over were issued first documents as fishing craft in December 1959--a decline of 14 vessels as compared with the same month of 1958. The major portion of the decline occurred in the Gulf area where only 4 vessels were issued first documents as compared with 11 in December 1958.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, December 1959

Area	December		Total			
	1959	1958	1959	1958	1957	1956
	(Number)					
New England	-	1	15	13	19	15
Middle Atlantic	-	-	12	13	23	26
Chesapeake	6	6	106	99	104	138
South Atlantic	2	4	76	135	130	119
Gulf	4	11	135	270	166	100
Pacific	2	5	97	112	102	76
Great Lakes	-	1	6	10	8	6
Alaska	-	-	32	31	48	40
Hawaii	-	-	-	-	-	1
Puerto Rico	-	-	-	-	1	-
Virgin Islands	-	-	-	1	-	-
Total	14	28	479	684	601	521

Note: Vessels assigned to the various areas on the basis of their home ports.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, December 1959

Net Tons	Number
5 to 9	7
10 to 19	4
20 to 29	2
50 to 59	1
Total	14

Table 3 - U. S. Vessels Issued First Documents as Fishing Craft, 1938 to 1959

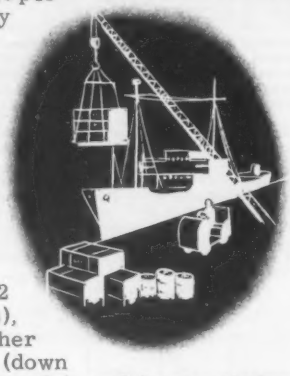
Year	Number
1959	479
1958	684
1957	601
1956	521
1955	418
1954	717
1953	729
1952	675
1951	780
1950	812
1949	1,002
1948	1,184
1947	1,300
1946	1,085
1945	741
1944	635
1943	358
1942	358
1941	354
1940	320
1939	357
1938	376

Year 1959: A total of 479 vessels were issued first documents as fishing craft during 1959--a decrease of 205 vessels (30 percent) as compared with 1958.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, NOVEMBER 1959:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during November 1959 decreased by 23.0 percent in quantity and 11.4 percent in value as compared with October 1959. The decrease was due primarily to lower imports of groundfish and other fillets (down 14.2 million pounds), frozen tuna other than albacore (down 10.6 million pounds), and frozen shrimp (down 5.0 million pounds). The decrease was partly offset by a 1.3-million-pound increase in the imports of lobster and spiny lobster, frozen albacore tuna (up 1.4 million pounds), and fresh and frozen salmon (up 2.4 million pounds).



U. S. Imports of Edible Fishery Products, November 1959 with Comparisons

Item	Quantity			Value		
	Nov.		Year	Nov.		Year
	1959	1958	1958	1959	1958	1958
	(Millions of Lbs.)			(Millions of $)		
Imports:						
Fish & shellfish: Fresh, frozen, & processed1/ . . .	86.9	80.1	956.8	26.5	22.7	278.4
Exports:						
Fish and shellfish: Processed only1/ (excluding fresh & frozen)	9.6	5.8	41.2	4.5	1.8	15.6

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

Compared with November 1958, the imports in November 1959 were up by 8.4 percent in quantity and 22.7 percent in value due to higher imports of frozen albacore tuna (up 1.1 million pounds), groundfish fillets (up 5.3 million pounds), canned tuna in brine (up 4.7 million pounds), and canned salmon (up 2.6 million pounds). Compensating, in part, for the increases was a drop of about 5.3 million pounds in the imports of tuna other than albacore and 1.7 million pounds in fresh and frozen salmon.

United States exports of processed fish and shellfish in November 1959 were higher by 52.7 percent in quantity and 136.8 percent in value as compared with October 1959. Compared with the same month in 1958, the exports this November were higher by 64.6 percent in quantity and 150.0 percent in value.

* * * * *

GROUNDFISH FILLET IMPORTS:

December 1959: Imports of cod, haddock, hake, pollock, cusk, and ocean perch, classified as fillets, during December 1959, totaled 3.2 million pounds. Canada was the leading country with 2.0 million pounds or 61 percent of December's total imports. Seven other countries supplied the remaining 39 percent.

The sharp decline since August 1959 in the imports of groundfish fillets was due to a United States Customs Court ruling which held that fish fillet blocks imported in bulk (15 pounds and over) are dutiable at one cent per pound under Tariff paragraph 720 (b) rather than 1½ cents per pound under Tariff paragraph 717 (b). This ruling became effective on September 15, 1959. Thus data on imports of groundfish fillets since that date are not comparable with previous figures.

Year 1959: Preliminary data indicate that United States 1959 imports of groundfish (including ocean perch) fillets and blocks into the United States totaled 144.9 million pounds as compared with 155.9

Table 1 - United States Imports of Groundfish (Including Ocean Perch) Fillets and Blocks, 1958-59

Country of Origin	1959	1958 1/
	. . . (1,000 Lbs.) . . .	
Canada	75,128	103,013
Miquelon and St. Pierre . . .	1,456	709
Greenland	938	189
Iceland	37,826	30,356
Norway	11,619	6,201
Denmark	14,195	9,779
United Kingdom	408	237
Ireland	3	-
Netherlands	632	552
France	-	91
West Germany	2,693	3,977
Union of South Africa	-	66
Japan	12	763
Total	2/144,910	3/155,933

1/Revised.
2/Does not include about 40.0 million pounds of blocks of fillets, bits and pieces received under Tariff paragraph 720 (b).
3/Does not include about 9.6 million pounds of blocks of bits and pieces received under Tariff paragraph 720 (b).

million pounds in 1958. An additional 40.0 million pounds of fillets, bits, and pieces were imported in 1959 and 9.6 million pounds in 1958 under Tariff paragraph 720 (b). This means imports of groundfish fillets under all categories totaled 184.9 million pounds in 1959 as compared with 165.5 million pounds in 1958.

Imports of groundfish classified as blocks of fillets in bulk (15 pounds and over), and bits and pieces are not included in table 1. The quota of groundfish and ocean perch fillets and blocks permitted to enter the United States at 1/8 cents a pound in the calendar year 1959 was 36,919,874 pounds, based on a quarterly quota of 9,229,968 pounds. The quota for the calendar year 1958 amounted to 35,892,221 pounds. Imports during individual quarters in excess of the established quarterly quota enter at a duty of 2½ cents a pound.

Note: See Chart 7 in this issue.

* * * * *

UNITED STATES FISH OIL EXPORTS SET RECORD IN 1959:

United States exports of fish oils (including fish liver oils) reached a record 72,240 short tons in 1959, slightly exceeding the previous high in 1955. The upsurge in exports follows 2 years of sharply declining shipments, notably to Western Europe--the major market for United States fish oils.

Exports to Western Europe in 1959 were up 74 percent from 1958 and accounted for virtually all of the total exports. Shipments to Sweden in 1959 were over 6 times larger than in the previous year, reflecting the shortage of Norwegian marine oils. Exports to the Netherlands last year were more than double those of 1958; however, they were almost 50 percent below the record volume of 1955. Shipments to Canada dropped sharply in 1959 following a recovery of Canadian marine-oil production late in 1958 and continued high output throughout last year in that country.

U. S. Exports of Fish Oils (Including Liver Oils) by Country of Destination, Averages 1935-39 and 1950-54, Annual 1955-59

Country of Destination	1959 1/	1958 1/	1957	1956	1955	Average 1950-54	Average 1935-39
	(Short Tons)						
North America:							
Canada	1,904	6,485	1,238	1,621	11,308	2,707	458
Cuba	57	99	129	112	84	113	155
Mexico	176	123	56	63	96	109	45
Other	146	12	9	37	3	26	71
Total	2,283	6,719	1,422	1,833	11,491	2,955	729
South America	6	26	42	62	56	84	96
Europe:							
Belgium-Luxembourg	2,167	2,344	661	759	1,098	215	8
Denmark	577	-	-	866	-	-	-
France	40	5	5	-	9	273	19
West Germany 2/	16,588	17,118	26,296	32,491	10,503	12,913	126
Italy	10	119	178	60	106	71	15
Netherlands	22,058	10,920	14,978	25,023	39,642	18,260	15
Norway	8,054	5,794	5,272	6,251	6,758	1,444	10
Sweden	20,355	3,370	7,716	2,646	-	-	7
Switzerland	-	558	794	367	646	4,994	15
United Kingdom	5	-	854	920	881	335	77
Other	-	-	-	-	23	25	8
Total	69,854	40,228	56,754	69,383	59,666	38,530	300
Asia:							
Philippine Republic	-	-	7	10	-	585	66
Other	30	31	6	5	55	28	24
Total	30	31	13	15	55	613	90
Africa	-	17	305	24	68	25	19
Oceania	-	-	4	-	-	-	-
Grand Total	3/ 72,240	47,021	58,540	71,317	71,336	42,207	1,234

1/Preliminary. 2/Total Germany. 3/Includes 67 tons whose destination is not indicated.

* * * * *

INPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, 1959:

Summary: During 1959, increased quantities of most fishery products were imported into the United States. Tuna again led all other fishery products in the quantity imported. Fish meal, groundfish and ocean perch fillets and blocks, shrimp, and other leading imports were also substantially higher than in 1958. Significant gains were reported for frozen tuna (except albacore), up 26 percent; canned tuna in brine, up 22 percent; frozen blocks of groundfish and ocean perch, up 22 percent; fish meal, up 33 percent; and shrimp, up 25 percent.

The quantities of leading U. S. fishery products exported were also generally higher than during 1958. As in past years, exports consisted primarily of fish oils and canned fish products. Exports of fish oils were up 54 percent from 1958 levels; canned salmon up 50 percent; canned sardines (not in oil), up 110 percent; and canned squid, up 63 percent.

Imports: Frozen tuna imports in 1959 were at a record high of 235,912,000 pounds. Japan supplied about 64 percent of that total. Additional quantities, however, were received in the United States by transshipment from Japanese tuna vessels operating in the Atlantic Ocean. Frozen tuna imports from Peru were nearly double those of 1958. A large increase also occurred in imports from Ecuador. Imports of frozen albacore were about the same as in 1958, but imports of other species of tuna rose 26 percent.

Tuna loins receipts increased during 1959. Japan supplied 4,731,000 pounds more in 1959 than in the previous year; total imports of 7,545,000 pounds were, however, less than the 10,600,000 pounds imported during 1957. Self-imposed limits by the Japanese have governed the quantity shipped to the United States.

Table 1 - U. S. Imports of Selected Fishery Products, 1959 Compared with 1958

Commodity	1959	1958
	....(1,000 Lbs.)....	
Groundfish and ocean perch:		
Fillets	99,544	95,442
Blocks or slabs 1/	85,290	70,089
Total	184,834	165,531
Fillets other than groundfish:		
Flounder	14,491	14,779
Fresh-water fish	15,930	14,568
Swordfish, mainly fillets	16,487	16,236
Other	20,971	19,550
Total	67,879	65,133
Tuna, fresh or frozen:		
Albacore	51,956	51,645
Other than albacore	183,956	146,313
Total	235,912	197,958
Tuna, canned in brine:		
Albacore	12,879	12,498
Other than albacore	42,428	32,948
Total	55,307	45,446
Tuna, canned in oil	830	756
Tuna, loins and discs	8,164	4,983
Bonito and yellowtail, canned	13,521	1,118
Crab meat, canned	7,306	5,854
Fish meal	265,910	200,704
Fish solubles	53,260	29,134
Lobster, fresh or frozen:		
Northern	20,635	21,413
Spiny	28,093	25,938
Lobster, canned	4,442	2,761
Oysters, mostly canned	5,953	5,379
Salmon:		
Fresh or frozen	19,700	26,180
Canned	31,155	29,226
Sardines:		
Canned in oil	21,152	18,001
Canned, not in oil	1,012	10,155
Sea scallops, fresh or frozen	5,110	3,903
Shrimp, mostly frozen, some canned and dried	106,555	85,394
Swordfish, fresh	5,572	4,106

1/Mostly fillets but including some bits and pieces.

Canned tuna receipts rose 22 percent above the previous record level of 1958. Owing to favorable tariff provisions, nearly all canned tuna imported is packed in brine. A 12½-percent ad valorem duty was paid on canned tuna in brine which entered under the 1959 quota of 52,372,574 pounds; a 25-percent duty was paid on about 2,934,000 pounds received over the quota. Canned tuna in oil, dutiable at 35 percent, was imported only in small amounts.

Fresh and frozen groundfish and ocean perch fillet (exclusive of blocks) imports increased slightly despite lower receipts of ocean perch fillets. Imports of frozen fillet blocks and slabs rose 22 percent to a record high. Canada accounted for 58 percent of the fillets and 50 percent of the blocks; and Iceland, for 27 percent of the fillets and 19 percent of the blocks.

On July 15, 1959, the U. S. Customs Court of New York ruled that all fish blocks were dutiable under Paragraph 720(b) at one (1) cent per pound, if the blocks and container weighed in excess of 15 pounds. Previously, fish fillets pressed and frozen into blocks had been subject to the same duty as plain fillets.

During 1959, imports of groundfish and ocean perch fillets, including blocks classified and received under Tariff paragraph 717(b), totaled 144,900,000 pounds. These were dutiable at 1-7/8 and 2-1/2 cents a pound, depending upon the status within the tariff quota applying to this paragraph. An additional 40,000,000 pounds of fillets in blocks or slabs, dutiable at one cent a pound under Tariff paragraph 720(b), were imported.

Prior to the ruling, frozen blocks of fillets accounted for a considerable part of the fillets entered at the 1-7/8 or 2-1/2 cent rate under the tariff quota. Since blocks of fillets are now classifiable under a different tariff paragraph, the entire quota at the 1-7/8 cent rate under paragraph 717(b) will be filled by fillets (not fillet blocks). As a result, larger quantities of such fillets will be imported at the lower rate of 1-7/8 cents.

Although the United States is one of the leading producers of fish meal, large quantities have been imported to supply the U. S. market. Imports of 132,955 short tons in 1959 were the highest since 1954. The principal foreign suppliers were Peru, Canada, and Angola.

During the past two years, Peru has been the leading foreign supplier of fish meal to the U. S. market. The fish meal industry of Peru is based on the anchoveta fishery. During 1959, the estimated Peruvian fish-meal production of about 300,000 short tons was over four times greater than its production in 1957. This rapid rise in production has made a large impact on the world trade in fish meal. A sharp increase in the U. S. production of fish meal and solubles and heavy imports caused prices to drop sharply in the last quarter of 1959. Prices in other world markets were also lower.

Fish solubles imports nearly doubled during 1959 reaching 26,630 short tons. Denmark, with 18,723 short tons, was the leading supplier. Fish solubles are a concentrate made from the liquid residue left in the production of fish meal.

Shrimp (mostly frozen) imported in 1959 increased by 25 percent and exceeded 100,000,000 pounds (heads-off) for the first time. Although Mexico supplied 64 percent, or the major share of those imports, 51 countries shipped shrimp to the United States. Among countries from which shrimp entered the U. S. market for the first time in 1959, British Guiana sent 970,000 pounds and Iran sent 740,000 pounds.

Canned salmon imports of 31,155,000 pounds in 1959 were at a record high level. Japan supplied nearly 30,000,000 pounds and Canada the remainder.

Canned crab-meat imports rose by 13 percent in 1959. Japan supplied nearly the entire amount. Crab meat packed in the Soviet Union is still prohibited from entering the United States.

Sea scallops, fresh or frozen: Both Canada and Japan, which supply almost the entire amount, sent increased quantities of sea scallops in 1959. Imports were up 31 percent.

Canned sardine imports (not in oil) fell sharply in 1959. This followed the past pattern of trade in this product. Heavier U. S. landings of pilchards in 1958 enabled domestic producers to pack sardines under more favorable conditions. Shipments in 1959 from the Union of South Africa fell to 619,000 pounds from nearly 8,000,000 pounds in the previous year. Norway, Portugal, and Denmark, the three leading U. S. suppliers of canned sardines in oil, all sent increased quantities in 1959.

Exports: Despite strong competition from foreign products, U. S. exports of canned sardines, not in oil, were 37,454,000 pounds, or more than double those of 1958. The Philippine market with 67 percent took the major share of those exports.

The United Kingdom continued to be the major market for U. S. canned salmon, taking 70 percent of the U. S. exports. During 1959, the Philippines was the other large market, reportedly taking over 2,000,000 pounds.

During 1959, canned squid ranked third in quantity of U. S. fishery exports. The Philippines, consistently an important market for U. S. canned fish, imported 6,139,000 pounds. Mediterranean countries, primarily Greece, have also been good markets for U. S. canned squid.

Table 2 - U. S. Exports of Selected Fishery Products, 1959 Compared with 1958

Commodity	1959	1958
	...(1,000 Lbs.)..	
Fish oils	144,481	94,043
Miscellaneous fish, mostly fresh-water	6,378	18,361
Oysters, shucked	783	834
Salmon:		
Fresh or frozen	1,464	1,083
Canned	13,826	9,227
Mackerel, canned	742	2,308
Miscellaneous canned fish (mostly California anchovies)	373	1,199
Sardines:		
Canned, not in oil	37,454	17,816
Canned in oil	1,270	645
Shrimp:		
Mostly frozen	2,091	1,648
Canned	2,875	2,161
Squid, canned	9,110	5,583

During 1959, U. S. exports of fish oils reached a record high of 144,481,000 pounds. European countries imported over 95 percent of this product. Sweden increased its imports of U. S. fish oils by about 34,000,000 pounds. The 40,710,000 pounds taken during the year placed Sweden second only to the Netherlands, as the leading buyer of U. S. fish oils.

The upsurge in exports follows two years of declining shipments, notably to Western Europe. Shipments to Sweden in 1959 were unusually large (over six times those of 1958), primarily reflecting the shortage of Norwegian marine oils. Shipments to Norway also increased. Shipments to Canada dropped sharply in 1959 following a recovery of Canadian marine-oil production late in 1958 and continued high output in 1959.

By far the world's largest importer of shrimp products, the United States also exports considerable quantities of shrimp. During 1959, exports of fresh and frozen shrimp were 2,091,000 pounds, up 27 percent from the previous year and of canned shrimp 2,875,000 pounds, up 33 percent. Cured shrimp, primarily sun-dried, is also exported. Canada takes the major share of the U. S. exports of frozen and canned shrimp and a large part of the cured shrimp.

* * * * *

SHRIMP IMPORTS, 1959:

United States imports of all shrimp (fresh, frozen, canned, and dried) from all countries in 1959 amounted to 106.6 million pounds as compared with 85.4 million pounds for the same period in 1958. Shrimp imports from Mexico in

United States Shrimp Imports (Fresh, Frozen, Canned, and Dried), 1958-59

Country of Origin	1959	1958
	. . (1,000 Lbs.) . .	
Mexico by Customs Districts:		
Florida	490	138
New Orleans	3,270	2,871
Laredo	21,631	20,947
El Paso	110	29
San Diego	1,444	1,718
Arizona	41,674	30,334
Los Angeles	34	61
St. Lawrence	1	-
Total Mexico	68,654	56,098
British Honduras	83	4
Greenland	-	41
Canada	134	263
El Salvador	1,838	1,129
Guatemala	182	39
Honduras	271	836
Nicaragua	213	278
Costa Rica	1,156	717
Panama	8,805	7,917
Canal Zone	64	193
Bahamas	-	4
Cuba	229	391
Leeward & Windward Islands	13	-
Netherlands Antilles	46	-
Jamaica	48	-
Colombia	1,899	890
Venezuela	370	121
British Guiana	967	-
Surinam	288	82
Ecuador	4,712	4,438
Peru	279	487
Chile	327	163
Brazil	79	-
Argentina	946	606
Iceland	32	16
Sweden	13	21
Norway	160	144
Denmark	196	46
United Kingdom	62	2
Netherlands	2	1
Western Germany	82	86
Finland	1	-
Spain	192	230
Italy	185	267
Lebanon	5	-
Turkey	2	5
Iran	740	-
Israel	43	14
India	2,866	1,700
Pakistan	640	637
Singapore	1	-
Philippines	1	5
Vietnam	1	1
Thailand	52	-
Korea	198	128
Hong Kong	640	4,029
Taiwan	15	-
Japan	7,229	2,552
Australia	284	362
Egypt	1,310	450
Grand Total	106,555	85,393

1959 totaled 68.7 million pounds as compared with 56.1 million pounds in 1958.

Most of the imported shrimp is frozen except for some canned shrimp from northern Europe and Japan and some dried shrimp from Hong Kong and Japan.

The United States imported shrimp from 48 countries in 1959 as compared with 39 countries in 1958. Some notable increases occurred in the imports of frozen shrimp from El Salvador, Costa Rica, Mexico, Colombia, Argentina, India, Japan, Iran, and Egypt. On the other hand, imports from Hong Kong dropped from 4,069,000 pounds in 1958 to only 640,000 pounds in 1959.

Note: Also see Commercial Fisheries Review, April 1958, p. 55.

U. S. Production of Fish Sticks and Portions, 1959

The United States production of fish portions in 1959 amounted to 37.0 million pounds, while the production of fish sticks totaled 60.3 million pounds. This was an increase of 15.2 million pounds or 70 percent in fish portions, but a drop of 643,000 pounds or 1 percent in fish sticks as compared with 1958.

Table 1 - U. S. Production of Fish Sticks by Months and Type, 1959[1/]

Month	Cooked	Uncooked	Total
	(1,000 Lbs.)		
January	5,717	548	6,265
February	5,784	556	6,340
March	5,132	462	5,594
April	4,342	366	4,708
May	4,084	314	4,398
June	4,284	291	4,575
July	3,477	306	3,783
August	3,560	312	3,872
September	4,752	591	5,343
October	5,434	395	5,829
November	4,496	324	4,820
December	4,406	327	4,733
Total Quantity 1959	55,468	4,792	60,260
	($1,000)		
Total Value 1959	27,062	1,889	28,951

1/Preliminary data.

During 1959, 5.5 million pounds of breaded cooked and 29.0 million pounds of breaded raw portions were processed. Of the 1959 total production of portions, 93 percent was breaded raw and cooked portions, and unbreaded portions (2.4 million pounds) accounted for the remaining 7 percent.

Table 2 - U. S. Production of Fish Sticks, 1955-1959

Month	1959[1/]	1958	1957	1956	1955
	(1,000 Lbs.)				
January	6,265	5,471	4,261	4,862	5,345
February	6,340	5,925	5,246	5,323	5,794
March	5,594	5,526	5,147	6,082	7,205
April	4,708	4,855	4,492	3,771	5,953
May	4,398	4,229	3,380	3,873	4,879
June	4,575	4,702	3,522	3,580	5,392
July	3,783	4,574	3,821	3,153	4,340
August	3,872	4,358	4,643	4,166	4,520
September	5,343	5,328	4,861	4,085	4,535
October	5,829	5,485	5,162	5,063	5,261
November	4,820	5,091	4,579	4,585	4,946
December	4,733	5,359	4,014	4,019	4,876
Total	60,260	60,903	53,128	52,562	63,046

1/Preliminary data.

Fish stick production in 1959 consisted of 55.5 million pounds of cooked fish sticks, or 92 percent of the total. The remaining 4.8 million pounds, or 8 percent, was made up of raw fish sticks.

Table 3 - U. S. Production of Fish Sticks, by Areas, 1959 and 1958

Area	1959[1/]		1958	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	25	50,448	24	49,905
Inland and Gulf States	6	5,408	4	6,003
Pacific Coast States	10	4,404	12	4,995
Total	41	60,260	40	60,903

1/Preliminary data.

The Atlantic Coast States led all other areas in the production of fish portions and fish sticks with 19.8 and 50.4 million pounds, respectively.

Table 4 - U. S. Production of Fish Portions, 1959[1/]

Month	Breaded			Unbreaded	Total
	Cooked	Uncooked	Total		
	(1,000 Lbs.)				
January	577	1,959	2,536	156	2,692
February	571	2,329	2,900	125	3,025
March	529	2,315	2,844	381	3,225
April	399	2,018	2,417	217	2,634
May	228	2,199	2,427	257	2,684
June	323	2,694	3,017	230	3,247
July	216	1,884	2,100	127	2,227
August	287	2,333	2,620	176	2,796
September	592	2,783	3,375	183	3,558
October	535	3,551	4,086	165	4,251
November	490	2,759	3,249	172	3,421
December	763	2,220	2,983	217	3,200
Total Quantity 1959	5,510	29,044	34,554	2,406	36,960
	($1,000)				
Total Value 1959	2,517	9,529	12,046	1,030	13,076

1/Preliminary data.

Table 5 - U. S. Production of Fish Portions, by Areas, 1958-1959

Area	1959[1]		1958[2]	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	25	19,793	19	12,047
Inland, Gulf, and Pacific Coast States	13	17,167	8	9,743
Total	38	36,960	27	21,790

1/Preliminary data.
2/Revised.

Table 6 - U. S. Production of Fish Portions, by Months, 1958-1959

Month	1959[1]	1958[2]
	(1,000 Lbs.)	
January	2,692	1,973
February	3,025	1,254
March	3,225	1,478
April	2,634	2,268
May	2,684	1,478
June	3,247	1,504
July	2,227	2,161
August	2,796	1,516
September	3,588	1,566
October	4,251	2,560
November	3,421	1,979
December	3,200	2,060
Total	36,960	21,790

1/Preliminary data.
2/Revised.

Washington

EXPERIMENTAL PLANTINGS OF EASTERN HARD CLAMS IN PUGET SOUND WATERS SUCCESSFUL:

Thousands of quahogs or hard clams (Mya arenaria) from Massachusetts are being planted on muddy beaches in Oyster Bay and other south Puget Sound areas by the Washington State Department of Fisheries in a mass clam-planting program. The mass plant is being made from a ton of hard clams. The shipment totaled between 15,000-16,000 cherrystone clams from 2 to 3 inches in length.

"Small test plantings of quahogs conducted the past two years at Pt. Whitney and elsewhere have proved highly successful," said the State's Fisheries Director. He believes that this mass plant will become the foundation of adequate seed stocks for use on muddy ground and beaches, favored by the eastern hard clam, but not utilized by any of the Pacific Coast native hardshell clams.

"For the time being, we are asking that these clams not be dug, in order to build up a good supply of seed stock," the Director stated.

Previous test plants of hard clams have proved successful, but this is the first large-scale transfer of the shellfish from the East Coast. It will not be the last. The plantings now under way will be followed by other mass plants in the San Juan Islands area on selected mud flat areas. It is also the beginning of a long-range, comprehensive program, instituted by the State's Fisheries Director, to fully utilize the State's oyster reserves and public clam beaches both commercially and for the enjoyment of the public for personal-use clam digging.

Fisheries Department personnel have begun a survey of public tidal areas to determine practical means of transplanting seed clams (both Pacific and Atlantic) from abundant areas to public clamming beaches and deep-water areas and for the distribution of native and cultured varieties of clam seed produced by laboratory rearing.

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GOVERNOR CONCERNED OVER OUTCOME OF LAW OF THE SEA CONFERENCE:

The Governor of the State of Washington announced on January 22, 1960, that he was concerned over the outcome of the forthcoming International Law of the Sea Conference scheduled to open on March 27, 1960, at Geneva, Switzerland.

He stated that the State of Washington stands to lose a good deal more under Canada's 12-mile territorial sea proposal than people realize.

"After conferring with the Director of Fisheries and others of the sport and commercial fishing industry, it appears the State's all-out effort to build up the salmon runs returning to Washington streams would be in jeopardy," the Governor said.

"I have issued instructions that it is the State's policy to cooperate with Canada and with our neighboring states in every way to maintain and improve the coastal fisheries resources. We have also made it clear that we will exert every effort to maintain our historic

fishing rights in common with our neighbors.

"If the two countries on State Department level fail at the Geneva Conference to balance these interests, our whole salmon program and coastal bottom fisheries may be seriously affected.

"I share this concern along with Senator Warren Magnuson that it may be necessary to send someone to the Geneva meeting to at least keep us informed about what takes place at the Conference," he remarked.

Wholesale Prices, January 1960

Prices in wholesale markets for edible fishery products (fresh, frozen, and canned) declined slightly (0.7 percent) between December 1959 and January 1960 to 121.9 percent of the 1947-49 average. A weaker market for drawn and filleted haddock was chiefly the cause for the drop. From January last year to January this year the wholesale price index was down almost 10.0 percent due mainly to lower prices for fresh and frozen shrimp and drawn and filleted haddock.

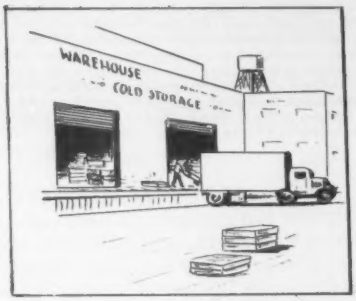

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, January 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1947-49=100)			
			Jan. 1960	Dec. 1959	Jan. 1960	Dec. 1959	Nov. 1959	Jan. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.9	122.7	120.7	135.4
Fresh & Frozen Fishery Products:					135.1	136.4	133.4	160.6
Drawn, Dressed, or Whole Finfish:					148.7	154.8	147.2	174.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.16	127.4	163.9	129.2	232.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.30	.31	93.8	96.4	95.9	103.7
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.77	.76	171.9	171.3	168.5	174.1
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.65	.47	159.9	115.3	179.7	166.1
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.80	.88	161.9	177.0	126.4	146.6
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.71	.59	166.5	138.4	164.2	153.6
Processed, Fresh (Fish & Shellfish):					135.8	134.6	134.0	154.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.44	.49	148.0	166.7	153.1	214.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.68	.65	106.6	101.9	102.7	150.1
Oysters, shucked, standards	Norfolk	gal.	7.00	7.00	173.2	173.2	173.2	148.5
Processed, Frozen, (Fish & Shellfish):					107.9	106.8	106.4	138.9
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.38	.38	98.1	98.1	98.8	108.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.31	.31	97.3	97.3	99.7	128.7
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.27	.27	108.8	108.8	108.8	124.9
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.65	.64	100.3	98.4	96.4	137.7
Canned Fishery Products:					103.8	103.8	103.4	98.9
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	114.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.80	10.80	77.9	77.9	77.9	79.3
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	88.1	91.0
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	90.1

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

Because of lower wholesale prices for large drawn haddock at Boston and frozen halibut and round whitefish at New York, the drawn, dressed, and whole finfish subgroup index declined 3.9 percent from December 1959 to January 1960. Compared with January a year ago, the subgroup index was down sharply (14.6 percent) with prices for large haddock down 45.3 percent, frozen dressed halibut down 9.5 percent, frozen dressed salmon down 1.3 percent, and Lake Superior whitefish down 3.7 percent. But wholesale prices for Great Lakes round whitefish and yellow pike were higher.

Fresh processed fish and shellfish wholesale prices in January increased by about 1.0 percent from the preceding month. An increase of about 3 cents a pound in fresh shrimp prices at New York was more than sufficient to offset a 11.2-percent drop in fresh small haddock fillet prices at Boston. Shucked oyster prices remained unchanged during the past three months. From January last year to January this year, the subgroup index declined 11.9 percent because of sharp drops of 31.0 percent in fresh haddock fillet prices and 29.0 percent in fresh shrimp prices. During the same period shucked oyster prices were higher by 16.6 percent.

The wholesale price index for frozen processed fish and shellfish in January 1960 was up 1 percent from the preceding month. A one-cent-a-pound rise in frozen headless shrimp prices at Chicago was responsible for this increase. However, a substantial decline of about 22.3 percent occurred in the wholesale price index for this subgroup from January a year ago to this January, due to lower first-hand prices for frozen fillets and frozen shrimp.

From December to January 1960 canned fish prices were unchanged, although there was some weakness in the wholesale prices for canned light meat tuna which was reflected in many types of promotional allowances rather than in listed prices. As canned tuna was the only canned fish item in good supply in January this year, prices for the other canned fish items were firm. As compared with January 1959, canned fish prices were higher by 5.0 percent this January due to higher (11.3 percent) canned pink salmon prices and lesser increases in prices for California and Maine sardines, and slightly higher tuna prices.

SHRIMP CREOLE--A TEMPTING DISH

Shrimp, one of the most versatile foods available, are in plentiful supply and are available fresh, frozen, cooked, and canned, in all parts of the country. The fine flavor and good food value of shrimp can be utilized in appetizers, soups, main dishes, and salads.

Although the recipes for Shrimp Creole may be many and varied, the home economists of the U. S. Bureau of Commercial Fisheries suggest the following recipe:

SHRIMP CREOLE

1½ pounds shrimp, fresh or frozen
¼ cup chopped onion
¼ cup chopped green pepper
1 clove garlic, finely chopped
¼ cup butter or other fat, melted
3 tablespoons flour
1 teaspoon chili powder
Dash pepper
1 teaspoon salt
2 cups canned tomatoes
Rice ring

Peel shrimp, remove sand veins, and wash. Cut large shrimp in half. Cook onion, green pepper, and garlic in butter until tender; blend in flour and seasonings. Add tomatoes and cook until thick, stirring constantly. Add shrimp and simmer uncovered for about 20 minutes. Serve in a rice ring. Serves 6.

International

FISHING FAIR AND NAUTICAL EXPOSITION TO BE HELD IN ITALY, JUNE 25 TO JULY 10, 1960:

The XX International Fishing Fair and the VI International Nautical Exposition will be held concurrently at Ancona, Italy, June 25 to July 10, 1960, according to an announcement by the Italian Government.

FOOD AND AGRICULTURE ORGANIZATION

EXPERT GROUP URGES GREATER STUDY OF RADIATION IN FOOD, AGRICULTURE, AND FISHERIES:

An expert committee on radioactive materials has recommended that the Food and Agriculture Organization and its member governments, when determining "the radioactivity burden of man," place greater emphasis on the importance of agriculture, fisheries, and food.

The Expert Committee on Radioactive Materials in Food and Agriculture, organized by FAO, met in Rome November 30-December 11, 1959, with scientists present from Canada, the German Federal Republic, Japan, the Netherlands, Sweden, the United Kingdom, and the United States.

The group was established to enable FAO to provide its member nations with expert opinion on the present state of knowledge of the movement and behavior of radioactive materials in food chains (uptake of radioactive isotopes from soil to plant to animals to human diet), and on survey and research programs needed to extend that knowledge.

The FAO Committee's report, now being completed, will be made available to the United Nations Scientific Committee on the Effects of Atomic Radiation, which was scheduled to meet in January 1960.

The Chief of FAO's Atomic Energy Branch and technical secretary of the Committee, said in an interview following the meeting:

"The applications of atomic energy are unavoidably associated with the release of varying quantities of radioactive materials into the environment, which may present a potential problem since they may be taken up from soils and waters by crops and livestock, and thus enter food.

"The scientific principles underlying agriculture, fisheries, and food production and utilization are, therefore, of particular significance for a proper understanding of the way in which radioactive substances behave in food and agricultural materials. Such understanding is essential if man is to learn to live safely in the presence of the general and local rises in environmental radioactivity that may occur in this atomic age."

Among recommendations put forward by the Committee are the following:

(1) Research on metabolism of radioactive materials should be encouraged as a prelude to means of reducing potential hazard;

(2) Research on decontamination of food products should include all dietary items that are relatively important carriers of radioactive materials, in order that scientists may be prepared to cope adequately with situations that might arise in the future;

(3) Governments should provide for representation by agricultural authorities on national radioactivity committees or should establish advisory committees to

International (Contd.):

ensure collaboration among atomic energy, public health, medical and food, agricultural, and fisheries authorities in programs of research and control in radiation protection;

(4) FAO should place increased emphasis on advising member governments in their responsibilities for research on and control of environmental radiation;

(5) The Director-General of FAO should periodically convene expert committees and technical meetings and symposia on the subject.

INTERNATIONAL JOINT COMMISSION
(UNITED STATES AND CANADA)

PROPOSED PASSAMAQUODDY TIDAL POWER PROJECT EFFECT ON FISHERIES SLIGHT:

The International Joint Commission (Canada and the United States) concluded a 3-day meeting with members of its International Passamaquoddy Engineering and Fisheries Boards. At the meeting held in Boston on January 13-15, 1960, the Commission was briefed by members of the boards concerning the possibilities for development of tidal power in Passamaquoddy and Cobscook Bays in Maine and New Brunswick.

The reports of the boards, which have previously been made available for examination by interested parties, indicate that an international tidal power project using the waters of Passamaquoddy and Cobscook Bays on the east coast of Canada and the United States is feasible from an engineering standpoint. There are questions, however, as to the economic feasibility of the project due to differences in interest rates in the two countries and other factors. The project would have to be combined with an auxiliary power source in order to obtain effective utilization of the tidal power. The boards also concluded that the construction, maintenance, and operation of the tidal power project, which would include fish passage facilities, would not have any significant adverse effects on the fisheries of the region.

The sessions were chiefly concerned with an analysis of the basic surveys and studies on which the board's findings were based. Also considered were the economic and financial aspects of the project reported upon by the boards.

Other factors requiring further consideration by the Commission include: the impact of the proposed project on the economies of the area; the significance of recreational benefits which may result from construction of the project; and evaluation of possible benefits peculiar to this unique project.

In order that the Commission may have the benefit of the views of all who are interested in this unique project, it has been decided that public hearings will be held in Maine and New Brunswick, Canada. An announcement will be made later of the time and place of such hearings.

INTERNATIONAL PACIFIC
SALMON FISHERIES COMMISSION

SALMON FISHING REGULATIONS FOR 1960 IN CONVENTION WATERS:

The tentative suggestions for regulatory control of the United States and Canadian 1960 sockeye or red salmon fishery in Convention waters in British Columbia and the State of Washington as submitted to the fishing industry on December 11, 1959, were discussed and reconsidered in view of suggestions submitted by the Advisory Committee at a meeting held by the Commission on January 19, 1960. Action taken by the Commission in modifying the original proposals is detailed as follows:

1. An analysis of the originally proposed closure in Juan de Fuca Strait scheduled for the period August 7 to 28 revealed that the limitation of fishing to three days weekly prior to August 7 actually made the effective starting date of the projected closure August 4 instead of August 7. In view of possible interference by the originally suggested closure period with an allowable full participation in the Chilko run, two days of fishing were added to the week commencing August 7.

2. Decision on the daily opening and closing hours for purse seines and gill nets in Canadian Area 20 was delayed by request pending possible agreement between the two types of fishermen operating in the area.

3. In the event of an emergency closure of Canadian District I for the conservation of sockeye during the period September 9 to 30, approval was given to the use of spring salmon nets under government regulation.

4. Approval was given to a proposal that a complete closure of United States Convention waters lying easterly of the Angeles Point-William Head line from August 14 to 28 followed by a relinquishment of regulatory control on the latter date be substituted for the original suggestion of a two-day fishing week for the period August 14 to September 18.

Recommendations Approved for Regulatory Control of Sockeye and Pink Salmon Fishing in Convention Waters for 1960

UNITED STATES CONVENTION WATERS:

All United States Convention Waters:

Closed June 20 to July 18 - except for spring salmon nets in waters easterly of the William Head-Angeles Point line under regulation by the State of Washington but having a mesh of not less than $8\frac{1}{2}$ inches.

West of William Head-Angeles Point Line:

July 18 to August 7 - purse seines open daily 4:00 a.m. to 8:00 p.m. Monday through Wednesday. Gill nets open daily 6:00 p.m. to 8:00 a.m. Monday afternoon to Thursday morning.

August 7 to August 14 - purse seines open daily 4:00 a.m. to 8:00 p.m. Monday and Tuesday only. Gill nets open daily 6:00 p.m. to 8:00 a.m. Monday afternoon to Wednesday morning.

August 14 to August 28 - closed.

East of William Head-Angeles Point Line:

July 18 to August 14 - purse seines and reef nets open daily 4:00 a.m. to 8:00 p.m. Monday through Thursday. Gill nets open daily 6:00 p.m. to 8:00 a.m. Monday afternoon to Friday morning.

August 14 to August 28 - closed.

International (Contd.):

CANADIAN CONVENTION WATERS:

West of William Head-Angeles Point Line:

June 20 to July 17 - closed.

July 17 to August 7 - purse seines open daily 12 hours* Monday through Wednesday. Gill nets open daily 12 hours* Sunday afternoon to Wednesday morning.

*Establishing of daily opening and closing hours delayed pending agreement between fishermen.

August 7 to August 14 - purse seines open daily 12 hours* Monday and Tuesday only. Gill nets open daily 12 hours* Sunday afternoon to Tuesday morning.

*Establishing of daily opening and closing hours delayed pending agreement between fishermen.

August 14 to August 28 - closed.

East of William Head-Angeles Point Line:

June 27 to August 14 - open 7:00 a.m. Monday to 7:00 a.m. Thursday.

August 14 to October 2 - open 7:00 a.m. Wednesday provided that in the case of emergency closures of District No. I during the period September 9 to 30, as required for the conservation of sockeye, fishing for spring salmon may be permitted under regulations by the Department of Fisheries with nets having a mesh of not less than 9 inches for linen nets and 9½ inches for nylon nets.

Note: All times mentioned are Pacific Standard Time.

TRADE AGREEMENTS

UNITED KINGDOM-TUNISIA AGREEMENT INCLUDES FISHERY PRODUCTS:

A trade agreement between the Tunisian Republic and the United Kingdom (signed at Tunis on November 16, 1959), valid for a year effective November 1, 1959, replaces the former "arrangement" between the two countries. The agreement provides for the exchange of some fishery products between the two nations and includes the following: Tunisian fishery products that may be imported into the United Kingdom without restrictions are fresh fish, dried octopus, shellfish (particularly shrimp and lobster), snails (probably land snails), canned fish, washed sponges, and cuttlefish bone. Tunisian fishery products that may be imported into the United Kingdom Overseas Territories are canned fish (particularly sardines). British fishery products that may be imported into Tunisia from the United Kingdom under quota are only salted, smoked, and frozen fish valued at £1,000 (US$2,800).

It is not known whether the new agreement will result in increased trade between the two countries. (United States Embassy report from Tunis, November 17, 1959.)

Angola

FISHING INDUSTRY SUFFERS FROM LOWER LANDINGS AND EXPORTS:

While Angola's fisheries exports continued to decline from 1958, fish landings were more encouraging. Comparing half-yearly data for 1959 with that of 1958, the sardine catch was up almost 50 percent from 10,309 metric tons worth 5,388 contos (US$187,000) ex-vessel in 1958 to 19,226 metric tons worth 7,777 contos ($271,000) in 1959. The increase was felt in both the Lobito/Benguela and the Mocamedes/Porto Alexandre areas. However, the catch of carapau (Selar crunenophthalmus Bloch), another important source of fish meal and oil, was down 12 percent to 39,114 tons and the value declined 39 percent to 16,814 contos ($585,000). A 14-percent increase in the catch of carapau at Mocamedes/Porto Alexandre was offset by a decline of almost 50 percent at Lobito/Benguela. Over-all fish landings declined from 108,051 tons in January-June 1958 to 101,544 tons in January-June 1959 and the value from 67,355 contos ($2,343,000) to 56,830 contos ($1,977,000). This decline was felt at all the major fishing centers.

Exports of the principal fishery products (fish meal, dried fish, canned fish, and fish oil) during the first ten months of 1959 were down by 28.7 percent in quantity and 15.7 percent in value as compared with the same period of 1958. Fish meal (the most important fishery export) exports (40,960 metric tons) declined by about 30.3 percent in January-October 1959 from the 58,736 tons exported during January-October 1958.

The problems of the fishing industry were brought up once again before the Angolan Legislative Council which held its semiannual session in October 1959. Taking note of this debate, the Minister of Overseas in Lisbon suggested the creation of a special fund to assist the industry. On a short-term basis he suggested that Angolan officials consider

Angola (Contd.):

Table 1 - Angolan Exports of Fishery Products, January-October 1958-59

Product	January-October 1959			January-October 1958		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Escudos	US$ 1,000	Metric Tons	1,000 Escudos	US$ 1,000
Fish meal	40,960	168,832	5,872	58,736	195,059	6,785
Dried fish	10,924	59,499	2,070	13,333	71,603	2,491
Canned fish	1,069	16,679	580	1,108	17,239	600
Fish oil	3,194	13,381	465	5,592	22,704	790
Total	56,147	258,391	8,987	78,769	306,605	10,666

the usefulness of the following emergency measures: (1) suspension of all export duties covering fish products; (2) creation of an additional income tax for all taxpayers; and (3) increasing the gasoline tax. Suspension of the export tax would ease the financial pressure on the firms, many of which are threatened with bankruptcy; and a tax would finance necessary credits to hard-pressed companies.

An extraordinary meeting of the Legislative Council on November 19, 1959, convoked solely to discuss the fishing problem, endorsed the first recommendation, strongly opposed the second, and called for further discussion of the third. The matter has been referred to Lisbon again for consideration by the Minister of Overseas.

One local newspaper has reported that the Ministry has taken action, but there has been no official confirmation of this, and the report may be wishful thinking. This source stated that the approved measures included: (1) establishment of a credit system financed and administered by the government on the basis of issuing bonds repayable in 18 years; (2) debts owed by the industry to the fishing guilds would be changed into loans repayable in 10 annual installments; (3) an Institute of Fishing of Angola would be established and the fishing guilds would be abolished, and (4) the guilds or the institute would no longer act as the seller of fish products as has been the practice.

As of October 1959, the only action taken from the recommendations of the various meetings has been the decision of the Angolan Government to waive payment of the income tax for 1959 by the fisheries industries.

The proposal to establish a credit system or credit institution has been strongly endorsed by the fishing industry for some time. Indeed, all the suggestions of the Minister of Overseas have been among those considered over the past two years. The important point for the industry was that the government was at last suggesting forms of specific assistance that it would give rather than continuing discussions in generalities.

Portuguese authorities wisely see that the problems of the fish industry are both short- and long-term. The immediate problems relate to the easing of the financial crisis facing the fishing companies. While all agree on the need for credit, financing this credit is quite another matter, since taxes are fairly heavy in Angola and the whole economy is in the throes of a recession with no signs of an upturn in the near future. The economy is in a poor position to support the fisheries industry for a long period just at a time when the coffee industry is also going to require some kind of public assistance. Thus, the strong rejection of the suggestion of an additional income tax to be borne by all represented sound reasoning. A gasoline tax increase, which may be approved, would be less damaging to the economy. The long-term bond issuance proposal mentioned by the press would be even more suitable to present conditions.

The long-term problem was only noted in recent discussions, the main emphasis being on the immediate financial crisis. Part of the program to get at the heart of the matter in the long run is to be a full study of the operation of the industry, the technical reasons behind the decline of the fish catch, and technical assistance. (United States Consulate in Luanda, December 12, 1959.)

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Angola (Contd.):

FUND ESTABLISHED TO SUPPORT THE FISHING INDUSTRY:

The Fundo de Apoio a Pesca (Fund to Support the Fishing Industry) was created by Legislative Decree No. 3,028 of December 23, 1959. The Fund is intended to provide short-term credits to Angolan fishing industry firms and the fishing guilds. It is to be supervised by an Administrative Commission composed of a president and no more than four delegates appointed by the Government General.

The Fund is to have its own annual budget together with a subsidy from the government budget, the amount of which is to be determined each year. The budget is to be financed by a gasoline tax of 20 centavos (US$0.007) per liter effective February 15, 1960, which is expected to produce 14,000 contos (US$490,000) each year. It is not known if this is to be the only source of funds for the Fund's annual budget since the size of that budget has not yet been announced. The subsidy for 1960 is to be 3,000 contos ($105,000) (United States Consulate report from Luanda, January 18, 1960.)

Australia

SURVEY SEEKS NEW SHRIMP FISHING GROUNDS:

An intensive survey for new shrimp grounds off Australia's east coast was initiated early in November 1959 by the trawler Challenge, under the supervision of the Fisheries Division of the Department of Primary Industry. The survey is financed from the Fisheries Development Trust Account and was scheduled for 28 weeks.

Exploratory shrimp fishing was started at Moreton Island, off Queensland's south coast, and extended as far south as Lakes Entrance in Victoria. The investigators hope to find new areas for fishing king and tiger shrimp and the new species located in deep water off Broken Bay, New South Wales, during a previous survey.

"This is a continuation of survey work already undertaken in past seasons on our potential shrimp fisheries by the officers of the Fisheries Division. It is a project which has already led to the discovery of the now widely-known Tin Can Bay shrimp grounds off Queensland's south coast and to the finding of king shrimp off Lakes Entrance where bad weather prevented the completion of survey work in March 1959. This further work should determine whether they exist in commercial quantities in this area," an official stated.

The survey will have as its main objective the search for shrimp grounds beyond a depth of 30 fathoms. The survey will extend beyond the continental shelf to depths of 150-160 fathoms.

"The Challenge may yet secure a place in Eastern Australian shrimp history because during the most recent survey undertaken by the vessel a large species of shrimp, believed to be previously unkown in Australian waters, was found in 150 fathoms off Broken Bay. If the shrimp proves to be a new species it is likely to be named after the Challenge," the official added.

The main aims of the survey are to determine whether commercial quantities of shrimp exist in the area surveyed, to define suitable areas in relation to types of sea bed, and to test and develop new types of shrimp fishing gear, especially for fishing the deeper beds.

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SCALLOP CATCH UP IN TASMANIA:

With slightly fewer vessels operating than in 1958, Tasmanian scallop production in the 1959 season (May-July) increased by 74,000 pounds to 907,832 pounds (meats only). In the D'Entrecasteaux area of Tasmania 574,732 pounds were landed, 14,003 pounds in Norfolk Bay area, and 319,097 pounds in the East Coast area. Fishing was concentrated in the Channel Area, mainly Great Taylor's Bay, during May and then moved to the East Coast in June and July.

Some 80 boats operated in the Channel at the commencement of the season and 9 on the East Coast, but towards the close of the season there were some 40 vessels operating on the East Coast.

Very good catches in comparatively deep water were made possible by operating the Baird type of sledge dredge. This dredge caused considerable controversy by its use in the Channel in the early part of the season, and following strong protests it was banned from the Channel by law.

The area bounded by Gordon Jetty, Huon, and Woody Islands, Alonnah Jetty, and the northern point of Sheepwash Bay was closed against dredging owing to a preponderance of small young scallops. Owing to the intensive dredging in the Channel in recent years, it was thought that production in the area would decline for some years, but this would be offset to a large extent by the exploitation of the new beds on the East Coast where prospects were most encouraging.

Norfolk Bay Area proved very disappointing and was not expected to return good catches for several years. (Australian Fisheries Newsletter, November 1959.)

Brazil

FISH PROCESSING PLANT COMPLETED:

On November 16, 1959, a new fish processing plant located at Maracana, Brazil (near mouth of the Amazon River), was completed. It was originally scheduled for completion in June 1959. The plant has modern machinery and equipment, including freezers with a capacity of 132,000 pounds of fish. It has a fish canning capacity of 100,000 cans a day and is expected to employ 300 workers. The plant is equipped with a powerhouse, ice-making machinery, and space for canning and printing labels. In addition, the new plant has space and equipment for processing Newfoundland cod. The total investment was Cr$87 million (about US$458,000) of which Cr$60 million (about US$316,000) was financed with Government aid. (United States Consulate report from Belem, December 4, 1959.)

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SHRIMP FISHING INDUSTRY:

Although Brazil, with a coastline of about 3,500 nautical miles, has fishing grounds suitable for shrimp fishing, especially along the coast between Rio de Janeiro and Rio Grande do Sul, it has no organized shrimp industry. There are no boats under the Brazilian flag built and equipped specifically for shrimp fishing. Shrimp fishing is carried on in any type of vessel and, more frequently than not, with inadequate equipment. Lack of adequate cold-storage facilities, even in such major fishing centers as the cities of Rio de Janeiro and Santos, make it necessary for much of the shrimp catch to be sold unfrozen either in the retail fish outlets or in the open-air markets. Shrimp exports from Brazil are negligible.

Landings: The landings of shrimp in Brazil in 1958 amounted to 18,557 metric tons valued at Cr$434.5 million (US$2.2 million) ex-vessel, as compared with 20,667 tons valued at Cr$315.4 million (US$1.6 million) in 1957, and 17,305 tons valued at Cr$285.1 million (US$1.4 million) in 1956.

Vessels: There are no modern vessels fishing specifically for shrimp in Brazil. However, the Brazilian Ministry of Agriculture is considering the purchase of a shrimp vessel in collaboration with the Oceanic Institute of the University of Sao Paulo. In addition, a private firm being organized in Rio de Janeiro hopes to purchase three small shrimp vessels and begin operations before July 1, 1961.

Ex-Vessel Price: As most shrimp caught in Brazilian waters is consumed on the domestic market and because of inadequate refrigeration facilities, the price per kilo varies from day to day. Excess shrimp is dried and salted for retail in grocery stores. The ex-vessel prices may vary from Cr$50 per kilo (about 11.4 U.S. cents a pound) for the smaller and less desirable varieties to Cr$200 per kilo (about 45.5 cents a pound) for large whites. It is believed that companies purchasing large and medium white shrimp ex-vessel for export pay about Cr$150 per kilo (about 34.1 cents a pound).

Exports: Export prices for frozen shrimp in December 1959 were about Cr$200 per kilo (about 45.5 cents a pound) for large and medium whites; however, prices often vary considerably due to the instability of the cruzeiro. Because of the inflationary period through which Brazil is passing, it may be expected that the cruzeiro value of shrimp will continue to increase. Exports of fresh and frozen shrimp in 1958 totaled 14,400 pounds and during the first six months of 1959 amounted to 12,300 pounds. Canned shrimp exports in 1958 amounted to 92,300 pounds and only 6,100 pounds during January-June 1959. With modern boats and facilities for processing and freezing, it is probable that Brazil could increase its exports of shrimp sharply.

Table 1 - Brazil's Exports of Processed Shrimp, 1957-58 and January-June 1959

Country of Destination	January-June 1959			1958 1/	1957 1/
	Qty.	Value		Qty.	Qty.
	1,000 Lbs.	1,000 Cr$	US$	1,000 Lbs.	1,000 Lbs.
Fresh or frozen:					
United States	1.3	103	516	14.4	-
British W. Indies	5.4	501	2,511	-	-
Dutch W. Indies	3.9	351	1,759	-	-
Cuba	0.4	35	175	-	-
Malaya & Singapore	0.9	91	456	-	-
Mozambique	0.4	25	125	-	-
Total	12.3	1,106	5,542	14.4	-
Canned shrimp:					
Canada	-	-	-	90.0	37.0
Union of South Africa	-	-	-	2.3	-
Dutch W. Indies	3.8	330	1,654	-	-
Belgium	1.8	177	887	-	-
Labanon	0.5	44	221	-	-
Total	6.1	551	2,762	92.3	37.0

1/Values for 1957 and 1958 omitted due to uncertainty as to exchange rate.
Note: Values converted at Cr$199.50 = US$1.

Current Export Controls or Taxes: Shrimp may be freely exported from Brazil, provided that the exporter obtains an export license from the Foreign Trade Department (CACEX) of the Bank of Brazil and a Sanitary Certificate ("Certificado de Sanidade"), certifying to the good condition of the shrimp, from the Ministry of Agriculture. Although there is no Federal export tax on shrimp, some states levy export taxes (e.g., Santa Catarina has a 5 percent tax) on shrimp exports.

Burma

SHRIMP INDUSTRY:

According to estimates by the Burma Department of Fisheries (no official statistics are available), annual shrimp landings total 1,000-1,500 metric tons valued at about US$35,000-$45,000.

The Burma Defense Services Institute has a joint venture agreement with a Singapore firm to provide 14 trawlers to fish the Limpi Island area (about 80 miles off Mergue Coast). The Singapore firm receives 35 percent of the catch.

No shrimp are exported and there are no present plans to expand the shrimp fishery. (United States Embassy report from Rangoon, December 17, 1959.)

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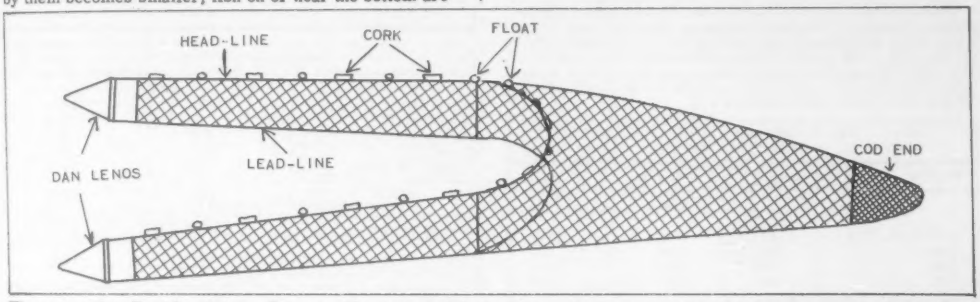
Canada

DANISH SEINE FISHERY FOR FLOUNDERS SUCCESSFUL:

Starting in the spring of 1959 on the west of Cape Breton Island, Nova Scotia, Danish seine-net fishing operations have paid off far beyond expections, it is reported in the Canadian Department of Fisheries journal Trade News of December 1959. Six boats have already been fitted (September 1959) with the gear, and two more are to join them.

The seining operation is relatively simple. It consists of surrounding a large area of sea bed with two very long ropes--each is almost a mile in length--and a net, in such a way that when the ropes are pulled in and the area enclosed by them becomes smaller, fish on or near the bottom are driven into the center where they are collected by the moving net. It can be operated only on grounds that are smooth and free of strong current and obstacles.



The net used in Danish seining. Set out with wings stretched wide apart, the net catches fish in a manner similar to that of the otter trawl as it is drawn along the bottom.

It was in 1951 that the Newfoundland Government first conducted investigations to determine if that method of fishing could be employed in Newfoundland waters. A Danish seine fishing ground for gray sole was discovered on the province's south coast, and commercial exploitation began in 1952.

In 1953-1954 fishery scientists, using the Newfoundland exploration vessel Matthew II, continued the research off Newfoundland and in Gulf of St. Lawrence waters west of Cape Breton. Results in the latter case were excellent. Near the shore of Cape Breton is a deep channel, the western side of which slopes gradually toward the Magdalen Islands. In the area was found a large expanse of sea bottom suitable for Danish seining. Experimental sets made in depths up to 40 fathoms produced excellent catches varying from 4,000-9,000 pounds of gray sole and sea dab.

It was this technological investigation that sparked Nova Scotia's interest in the seining technique. Potentiality of that type of fishing in Nova Scotia waters was immediately evident to the Industrial Development Service of the Department of Fisheries and also the Fisheries Division of the Nova Scotia Department of Trade and Industry.

One of the first steps was the acquisition of Danish seining equipment, and the first unit was put into operation out of Queensport, Nova Scotia. The provincial department hired an Icelandic fisherman to instruct fishermen in the use of the gear.

In cooperation with the Federal Department's Industrial Development Service, the provincial fishery agency successfully prosecuted the initial project. The two agencies combined to produce a suitable winch for hauling the gear. Constructed originally with two automobile rear-axle units, the winch is now being manufactured near Pictou. The original design has been modified and it is now a highly efficient piece of machinery.

One of the pioneers of Danish seining in Cheticamp is the master of the Lady of Fatima. He fitted his boat during the winter and on May 1 he was off to the fishing grounds. From that date until June 13, 1959, he had landed close to 200,000 pounds of flounders.

Soon the pioneer fishermen's colleagues had their boats equipped with Danish seines. By the middle of June, six Cheticamp boats were on the grounds. Right from the beginning the operations paid off. Catches have been running as high as 50,000 pounds in five days. Some boats have had daily catches as high as 25,000 pounds. At 3-1/2 cents a pound, 25,000 pounds of flounders is a profitable operation for a boat under 60 feet in length with a crew of four men.

The Cheticamp fishermen have voluntarily adopted a 5-1/4 inch mesh which enables small fish to escape. This mesh size adopted by the Cheticamp seiners is larger than the 4-1/2 mesh adopted by the 12-member countries of the International Commission for Northwest Atlantic Fisheries.

On top of that the catch is carefully culled aboard so that unmarketable fish can be thrown back into the sea to be fished another day.

Since seining was started in this area the vessels have been averaging between C$650 and C$700 a trip. Average landings have been in the vicinity of 20,000 pounds. One vessel in 10 trips landed 192,967 pounds of flounders, for a total fare of C$6,690. In seven trips another vessel landed more than 128,000 pounds to bring the skipper and crew nearly C$4,400.

Colombia

TUNA LANDINGS IN BARRANQUILLA:

Fresh tuna landed by the Japanese tuna long-liner Seiun Maru helped reduce retail food costs in Barranquilla, Colombia, during December 1959. The vessel delivered over 200 metric tons of tuna to its shoreside affiliate, for distribution throughout the city at the authorized price of two pesos (about 26 U. S. cents) a pound.

The Seiun Maru was due to return to Japan for overhauling, but will be replaced by another vessel from Japan. (U. S. Consulate report from Barranquilla, December 30, 1959.)

Costa Rica

SHRIMP INDUSTRY:

Landings: Shrimp landings in Costa Rica increased sharply beginning about June 1958 and totaled about 1.5 million pounds for the 12 months ending May 1959. The sharp increase in the landings in 1958 and continuing into 1959 was due to an increase in the shrimp fishing fleet from 17 vessels active prior to June 1958 to 28 Diesel-powered vessels active as of November 1959. In August 1959 a peak total of 33 vessels was engaged in shrimp fishing. About 10 vessels are 55 to 60 feet in length and the remainder 25 to 40 feet. About 20 shrimp trawlers (varying from 45 to 60 feet in length) are reported under construction in Puntarenas. But it is probable that many of them may not be completed because of lower catches and prices.

All the shrimp catch is taken in the Pacific Ocean and the fishing grounds are limited to three small areas. Due to the small areas available for shrimp fishing, it is believed that the landings of about 1.5 million pounds from June 1958 to May 1959 represent the peak production possible from Costa Rica's Pacific coast and future landings will probably level off to a total somewhat smaller.

Table 1 - Shrimp Landings in Costa Rica, 1956-58 and Jan.-Oct. 1959

Period	Large 1/	Small 2/	Total
	(1,000 Lbs.)		
1959 (Jan.-Oct.)	1,002	168	1,170
1958	790	140	930
1957	191	180	371
1956	424	95	519

1/Headless shrimp. 2/Heads-on shrimp

Shrimp landed in Costa Rica are not classified as to species in official records. Observers estimate that about 99 percent of the catches consist of Penaeus occidentalis and P. stylirostris with about two-thirds of the landings consisting of P. occidentalis. The remaining 1 percent of the landings consists of P. vannamei, P. californiensis, and P. brevirostris. The small brown shrimp which are consumed locally are principally Xiphopeneus riveti.

Landings of large headless shrimp for the first 10 months of 1959 amounted to 1 million pounds, or about 26.7 percent more than the 790,000 pounds landed in 1958. The landings in 1958 were over three times the 191,000 pounds of large shrimp landed in 1957 and about 86.6 percent higher than the landings made in 1956.

Table 2 - Costa Rica's Shrimp Landings by Months, 1958-59

Month	No. Vessels Fishing	1959		1958	
		Large 1/	Small 2/	Large 1/	Small 2/
		(1,000 Lbs.)			
January	24	143	10	11	3/
February	26	145	13	14	1
March	28	158	17	26	1
April	29	131	38	45	10
May	31	114	30	22	10
June	32	83	7	81	4
July	33	90	9	85	6
August	33	52	12	82	18
September	28	38	17	80	17
October	28	48	15	73	36
November	-	-	-	127	20
December	-	-	-	144	27
Total	292	1,002	168	790	140

1/Headless shrimp. 2/Heads-on shrimp. 3/Less than 500 lbs.

Ex-Vessel Prices: At the vessel level shrimp is sold in only two categories--large headless shrimp and heads-on small or "brown" shrimp. These two types are not broken down any finer at the vessel level.

Ex-vessel prices on November 16, 1959, for large headless shrimp were three colones (47 U.S. cents) a pound for headless large shrimp and one colon (16 cents) a pound for small shrimp with heads on. (The free rate for the colon is 6.63 to one U.S. dollar, but due to export controls the rate on exported shrimp averages 6.27 colones to one dollar.) In August 1959 the price of large shrimp was reduced from 3.50 to 3.00 colones (59 to 47 cents) a pound. No reduction was made in the price of small shrimp.

Production Costs: The cost of catching shrimp in Costa Rica as of November 1959 (based on average monthly landings of 5,000 pounds of headless shrimp per vessel per month, but catches were averaging less in the fall of 1959) amounted to about 33 U.S. cents a pound. Per vessel the gross profit was about US$750. The cost of depreciation and insurance has been omitted from the calculations because finfish caught and landed by the shrimp vessels is believed to be valuable enough to take care of those costs.

Table 3 - Estimated Monthly Costs for Catching Shrimp in Costa Rica with a Modern 60-Foot Trawler 1/ Averaging 5,000 Pounds of Large Headless Shrimp a Month, November 1959

	Colones	US$	Cost per Lb. in U. S. ¢
Crew share 2/	4,050	646	12.9
Fuel and oil	2,000	319	6.4
Ice	1,260	201	4.0
Gear	2,000	319	6.4
Upkeep of vessel	1,000	159	3.2
Total	10,310	1,644	32.9
Sale of shrimp	15,000	2,392	47.9
Profit	4,690	748	15.0

1/Valued at 250,000 colones (about US$40,000).
2/Percentage share of 27 percent with an ex-vessel price of 3 colones (47 U. S. cents) was used.
Note: Values converted at rate of 6.27 colones = US$1.

The crews consist of 4 or 5 men who furnish their own food. Crews are paid on a percentage basis of the catch. This percentage varies between 25 and 33 percent in accordance with the quality of the boat. The better boats pay the smaller percentage.

Fuel and oil in table 3 is figured on the basis of 2,000 gallons of Diesel at 99 centavos (16 cents) a gallon and allowing 1 centavo (0.16 cents) for oil costs for each gallon of Diesel oil used.

Ice in table 3 was on basis of 140 blocks of ice at 9 colones ($1.44) per block.

In table 3 under gear are included nets, boards, cables etc. This includes one new net a month which seems somewhat high, but perhaps with double-rig this may be true.

Processing Costs: The cost of a pound of frozen headless shrimp landed in Miami, Fla., in November 1959 was about 68.4 cents a pound and breaks down as follows: 47 U.S. cents was paid to the vessels; 5 cents for dock charges, grading, and packing; 3.5 cents for cartons, cases, and strapping; 2.5 cents for glazing, freezing, and storage; 1.0 cent for transportation from Puntarenas to San Jose; 2.5 cents for loss in exchange control (35 percent of export dollars are converted at 5.60 colones and 65 percent at the free rate of 6.63 colones to US$1); 1.4 cents for export tax of 2 percent (normal export price is 70 cents a pound); and 5.5 cents a pound (net weight) for air freight to Miami. To New Orleans the freight amounts to 7.7 cents.

Table 4 - Costa Rica's Exports of Frozen Headless Shrimp, 1956-58 and January-June 1959, from Costa Rican Records

Country of Destination	Jan.-June 1959		1958		1957		1956	
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
United States	476	230	427	255	217	92	484	213
Other	30	19	12	12	13	6	8	3
Total	506	249	439	267	230	98	492	216

Costa Rica (Contd.):

Table 5 - Exports of Frozen Shrimp from Costa Rica to United States, 1956-58 and January-June 1959 from U.S. Customs Records

	Jan.-June 1959		1958		1957		1956	
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
United States....	853	-	717	435	227	99	421	205

Shrimp Exports: Shrimp exports from Costa Rica are principally to the United States. Official Costa Rican statistical records of exports to the United States in some years vary considerably from United States Customs records. Official Costa Rican exports of frozen headless shrimp to the United States for January-June 1959 show 506,000 pounds (U.S. Customs records for same period, 853,000 pounds). The value of shrimp f.o.b. Costa Rica (based on Costa Rican statistics for January-June 1959) was 48.2 U.S. cents a pound as compared with 59.7 cents for the 1958 exports. However, the f.o.b. value of 48.2 cents a pound for January-June 1959 was 5.9 and 4.3 cents a pound above the 1956 and 1957 values, respectively. The large shrimp are exported as white shrimp. Probably 90 percent of the exports and landings are shrimp of the size 20 headless shrimp to the pound or larger. There are practically no exports of 30-count headless shrimp, except in the peeled and deveined category. (United States Embassy report from Mexico, November 27, 1959.)

Cuba

SHRIMP FISHERY TRENDS, DECEMBER 1959:

During 1958 Cuban shrimp landings were about 2.7 million pounds (heads-off) and exports (almost all to the United States) amounted to 390,000 pounds (headless). Following the change in the Cuban Government, the shrimp industry since November 1959 has been gradually absorbed by the National Institute of Agrarian Reform, which apparently will convert it into a cooperative enterprise operated by the shrimp fishermen.

The shrimp fishing fleet in 1959 was estimated to consist of 25-30 vessels. All are Diesel-powered and average about 45 feet in length over-all. The present fleet is believed to be adequate to exploit the shrimp fishing grounds known at present. No construction of new shrimp fishing vessels is under way and future plans under the Agrarian Reform plan are unknown.

Prior to the present unsettled condition of the shrimp fishing industry, the fishermen were paid 23 U. S. cents a pound for heads-off shrimp. Very small shrimp brought 10 cents a pound to the fishermen. Costs of sorting, packing, freezing, storing, and other handling amounted to about 15 U. S. cents a pound.

There are no export controls or taxes applicable to the export of Cuban shrimp. The new Cuban Government is anxious to encourage industries with export possibilities in order to lessen its dependence on the sugar crop. The future of private enterprise in the shrimp and other segments of the fishing industry is uncertain. The largest shrimp-producing firm had its vessels and shore facilities taken over in November 1959 and the remaining vessels and facilities were absorbed in December. It remains to be seen what impact these measures will have on shrimp landings, prices, quality, and exports. (United States Embassy report from Havana, December 1, 1959.)

Denmark

FISHERIES IN THE EUROPEAN FREE TRADE AREA:

An analysis of the trade problems confronting Danish fisheries as a result of Denmark's membership in the European Free Trade Area (United Kingdom, Switzerland, Portugal, Austria, Norway, Sweden, and Denmark) is contained in an article ("The Market Plans") in the 1960 edition of the Fisheries Yearbook published by the Danish Ministry of Fisheries. The article discusses: (1) negotiations toward the EFTA; (2) position of fish within the EFTA; (3) present treatment of fish imports by members of the EFTA; and (4) Danish fish exports to EEC and EFTA nations.

After the negotiations within the Organization of European Economic Cooperation (OEEC) for a broad free trade area came to a stop, those OEEC nations remaining outside the European Economic Community (EEC) or Common Market feared that their exports to the EEC would be adversely affected. This was especially true for the industrial nations, and thus it was England and Sweden who took the initiative in forming the EFTA.

Originally, Denmark feared that the establishment of two market areas would

Denmark (Contd.):

lead to a trade war between them. Then Denmark would be dangerously situated with one of its two principal customers (England and Germany) belonging to each area. In the later negotiations toward the EFTA, Denmark managed to have it firmly established that the EFTA would first and foremost strive for renewed negotiations with the EEC for a closer connection with it.

During the negotiations toward the EFTA Denmark supported the Norwegian proposal that frozen and canned fish preserves, fish meal and fish and whale oil be treated as industrial products, and that a special agreement be negotiated concerning fresh fish and other fish products. Denmark also emphasized the Danish and Faroese interest in the removal of the United Kingdom duty on fresh fish.

A meeting of ministers was necessary to iron out several of the important differences over fish with the result that the following products will be treated as industrial goods within the EFTA: (1) canned and half-frozen fish, crabs and shellfish; (2) frozen fish fillets; (3) frozen, peeled, deep sea shrimp (prawn); (4) fats and oils from fish and sea animals; (5) fish flour; (6) fish solubles; and (7) meal from algae, seaweed, etc., for use as animal fodder.

With regard to frozen fillets the negotiations were extremely difficult. Denmark and Norway placed great importance on obtaining free entry to the British market. In 1958 Danish and Norwegian exports of frozen fillets to the United Kingdom were only 3,500 metric tons and 1,000 tons, respectively, but there is no doubt that the future will bring a great increase in the consumption of fillets. After the greatest reluctance from the British side an arrangement was finally agreed upon that the British customs duties and import taxes would be abolished on the condition that imports from Denmark, Norway, and Sweden would be increased gradually and not exceed 24,000 tons a year by January 1, 1970. If imports exceed 24,000 tons before that time, the United Kingdom, unless a special agreement concerning trade is reached by the Council of the EFTA, can withdraw the tariff concession in order to reduce imports to this amount. Great Britain has also reserved the right to reopen the question of a tariff on frozen fillets if the conditions of competition should be fundamentally altered (and by this was meant a broadening of fishing rights in territorial waters). Denmark and Norway have not been able to acknowledge this condition insofar as there may be a broadening in agreement with internationally-recognized rules.

With respect to the fish and fish products which are not to be treated as industrial goods under the treaty, which include fresh, salted, or smoked fish, and frozen fish other than fillets, it is provided in the treaty that the purpose shall be to provide for an increase in trade in these products so that there will come about a reasonable degree of reciprocity for those nations whose economy to a great extent is dependent upon the export of these fish products. Before January 1, 1961, the Council of the EFTA is to undertake an investigation of the various conditions governing trade in these products, naturally with the purpose of increasing free trade. The Council is also empowered to transfer individual fish products to that group which is treated as industrial products.

Naturally these results are not wholly what Denmark would have wished, but it is important to note that the Council of the EFTA will, in the course of the coming year, investigate the question of the inclusion of fresh fish. It is necessary that the Danish fisheries industry make its position on this question clear, because the tariff concessions which can be obtained within the EFTA if fresh fish is eventually accepted as an industrial product are largely confined to the existing United Kingdom duty of 10 percent. Quantitative restrictions against the import of fresh fish exist, practically speaking, only in Sweden and Denmark. One must remember that if fresh fish is treated as an industrial product, then the other rules of the treaty will also apply to fresh fish, namely, the right of free establishment of business.

The Faroes and Greenland for the time being will remain outside the EFTA, but can join merely by an announcement from the Danish Government.

To assess the significance of the provisions of the EFTA treaty concerning fisheries one must first be fully acquainted with the present treatment of fish by the

Denmark (Contd.):

members of the EFTA. As mentioned above, quantitative restrictions play only a small part but customs duties vary considerably from nation to nation.

In the United Kingdom there is an advalorem tariff which averages about 10 percent on fresh and canned fish. For lobster and shrimp the duty is 30 percent. On fish flour the duty is usually 10 percent, but herring flour is customs free.

In Norway there is generally no tariff on fresh, frozen, or salted fish, but on canned fish there are varying duties, generally at about the same level as in Denmark.

In Sweden fresh fish is largely customs free but on canned fish there are considerably higher duties than in Denmark. Sweden also has a special import tax on fillets of cod, whiting, and haddock, etc., of 45 Swedish ore per kilo. In Switzerland there are duties on all fish products and the incidence varies from 0.50 Swiss francs per 100 kilos to 120 Swiss francs. On the products which have special interest for Denmark such as fresh, iced, and frozen fish and fillets, the duty is 0.50 Swiss francs; on trout it is 15 Swiss francs per 100 kilos. On canned fish the duty varies from 2 to 120 Swiss francs. By negotiations with Switzerland, however, it has been agreed that the prevailing customs duties on all types of fish products except trout will be liquidated according to the rules for industrial goods under the EFTA.

In Austria there is no duty on fresh, iced, or frozen fish. There is a 20-percent duty on smoked eel and salmon. There is a 15-percent duty on fish canned in oil. On other canned fish products the duty varies considerably averaging about 540 shillings per 100 kilos.

The duties in Portugal have scarcely so much interest but it can be mentioned that they are about 2 Danish kroner per kilo on canned fish. The duty on cod is minimal. (U. S. Embassy report from Copenhagen, December 29, 1959.)

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FISHERY PRODUCTS INCLUDED IN TRADE AGREEMENT WITH EAST GERMANY:

Following negotiations held in Copenhagen and East Berlin, a new unofficial trade agreement for the calendar year 1960 was concluded on November 13, 1959, between four Danish Trade Associations and the East German Chamber of Foreign Commerce. Similar trade agreements have been made since 1956. Fishery products make up about 21.7 percent (US$3.3 million) of the total Danish exports to East Germany of about US$15.4 million under the agreement. No fishery products exports by East Germany are included in the agreement. (U. S. Embassy dispatch from Copenhagen December 22, 1959.)

Table 1 - Danish Proposed[1/] and Actual Exports of Fishery Products to East Germany, 1956-1960

Fishery Products	1960	1959		1958		1957		1956	
	Proposed	Proposed	Jan.-Oct. Actual	Proposed	Actual	Proposed	Actual	Proposed	Actual
				(US$1,000[2/])					
Fresh and Frozen	2,174	2,174	-	1,348	-	1,304	-	1,304	-
Canned	580	580	-	580	-	725	-	725	-
Fresh, Frozen, and Canned	-	-	1,797	-	2,536	-	623	-	1,261
Fish Meal	580	290	261	188	159	43	-	43	14
Total	3,334	3,044	2,058	2,116	2,695	2,072	623	2,072	1,275

1/Agreement became effective on July 20, 1956, and was extended through 1957-60 annually.
2/Danish kroner converted to U. S. dollars at rate of 6.9 kroner = US$1.

FISHING INDUSTRY HAS RECORD YEAR IN 1959:

Preliminary statistics on Denmark's fishing industry for 1959 indicate a record year for total landings, exports, and investments. However, the Danish per capita consumption of fishery products remained unchanged from 1958 at about 27.6 pounds.

In 1959, landings amounted to about 1,453 million pounds, valued at 365 million kroner (US$53 million) as compared with 1,312 million pounds, valued at 335

Denmark (Contd.):

million kroner ($48.5 million) in 1958. The landings consisted of 1,389 million pounds of fish and crustaceans, 48.5 million pounds of mussels, and 15.4 million pounds of pond trout, increases of 125.7, 13.2, and 2.2 million pounds, respectively, over 1958.

Most of the increase was in landings of species used for reduction. The fish meal and oil plants purchased 904 million pounds as compared with 838 million pounds in 1958. These plants produced 156.5 million pounds of fish meal (145.5 million pounds in 1958), 41.9 million pounds of fish oil (37.5 million pounds in 1958), and 50.7 million pounds of fish solubles (33.1 million pounds in 1958). The fish filleting firms processed 127.9 million pounds in 1959, an increase of 10 percent over the preceding year.

Exports in 1959 increased to 562.2 million pounds from 489.3 million pounds in 1958. The exports in 1959 were valued at 419 million kroner ($60.8 million), an increase of $5.8 million from 1958. Export markets for fishery products were generally firm, except the fish meal and solubles, which suffered from increased competition in world markets. Exports of frozen pond trout, especially to the United States, reportedly found a better market in 1959.

Investments in the fishing industry were at an all time high due primarily to the program for replacing part of the fleet with steel cutters. The total value of the Danish fishing fleet in 1959 was 288 million kroner ($41.8 million), up 22 percent from 1958.

During 1959, registrations of new vessels amounted to 100 and included 33 steel cutters. The steel cutters as of the end of 1959 made up 6 percent of the fishing fleets. A total of 376 million kroner ($54.5 million) was invested in vessels and equipment in 1959. (United States Embassy report from Copenhagen, January 5, 1960.)

Note: Values converted at rate of 6.912 kroner = US$1 in 1958 and 6.893 kroner = US$1 in 1959.

Ecuador

JAPANESE FISHERIES RESEARCH VESSEL STUDYING MARINE RESOURCES:

The Japanese fisheries research vessel Umitaki Maru arrived in Guayaquil, Ecuador, on December 15, 1959. The vessel carries a complement of 20 officers, 45 cadets, and 26 seamen from the Fisheries University of Tokyo. The group is studying marine resources and oceanography and has proceeded from Tokyo, Honolulu, and the Galapagos Islands. The vessel reportedly will go on to Chimbote, Callao, and again visit the Galapagos prior to returning to Tokyo.

Several officials and scientists of the expedition came to Quito and paid courtesy visits to the President, the Minister of Development, and other government officials. The group is reported in the press as having expressed to the Minister of Development their views with respect to territorial waters, including those corresponding to the Galapagos Islands, as they are interested in the resources in that area. (U. S. Embassy report from Quito, December 18, 1959.)

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Large Danish beach-landing fishing craft which are both launched and hauled ashore with the help of large electrical winches. In Denmark many fishing craft are landed direct onto beaches.

Ecuador (Contd.):

SHRIMP INDUSTRY:

Landings: Detailed statistics on the landings of shrimp in Ecuador are unavailable and estimates are based on the weight of the finished product. According to estimates by the Banco Central, Ecuador's shrimp landings (heads on, heads off, and peeled and deveined shrimp) in 1958 amounted to 2,721 metric tons, valued at about US$4.1 million (at official rate of exchange of 15 sucres to US$1). This compared with 2,137 tons valued at $3.0 million in 1957 and 2,342 tons valued at $2.5 million in 1956. It was estimated that landings for 1959 were about 25 percent higher than in 1958.

Species Composition of the Catch: There are no accurate records of species composition. It is estimated that the landings of large shrimp are made up of about 5 percent Penaeus vannamei and the balance of 95 percent consists of P. occidentalis and P. stylirostris. During 1959 occasional catches were made of pink shrimp (P. brevirostris) off Manta and in the Gulf of Guayaquil.

Shrimp Fishing Vessels: Estimates from semiofficial sources of the number of vessels active in the shrimp fishery were 180 in 1959, 127 in 1958, 60 in 1957, and 27 in 1956. Industry sources estimated that on December 1, 1959, the vessels engaged in shrimp fishing totaled 120 to 130 instead of 180. The shrimp vessels range from 40 to 60 feet in length with Diesel engines rated between 90 and 200 hp. Most of shrimp fishing vessels have brine tanks for preserving the catch. There is one floating freezership which does not fish. In addition to the vessels flying the Ecuadoran flag, there were 27 foreign flag vessels operating out of Ecuador in 1956, 29 in 1957, but only 3 in 1958 and none in 1959.

The shipbuilding program has come to a stop due, it is believed, to the drop in shrimp prices in the United States market. A few of the vessels, now in various stages of construction, will be finished, but unless market conditions improve it is likely that the shrimp fleet will decrease in numbers.

Production Costs: For shrimp (headless) counting under 10 to the pound packed in 5-pound cartons, the cost f.o.b. Ecuador late in 1959 was estimated to range from 64 to 67 U. S. cents a pound. This cost is based on an ex-vessel price of 51.5 cents a pound; a cost of 8 U. S. cents a pound for grading, freezing, packing material, and loading; 2 U. S. cents a pound loss due to exchange control; and 4.5 U. S. cents a pound for export duties and port charges. Costs from the Ecuadoran port to New York City for ocean freight, insurance, unloading at port of entry, and storage charges amounted to about 6 to 7 U. S. cents a pound. Most of the shrimp is sold on consignment, and the export price would be the New York wholesale selling price less commission, storage, transportation, and unloading costs in the United States, and less ocean freight and insurance.

Ex-Vessel Prices: Prices (pack-out basis) being paid to the vessels for headless shrimp in December 1959 were as follows: white shrimp under 10 count: whites, 51.5 U. S. cents; pinks, 45.7 cents; 11-15 count: whites, 45.7 cents; pinks, 40 cents; 16 to 20 count: whites, 40 cents; pinks, 34.3 cents; 21 to 25 count: whites, 34.3 cents; pinks, 28.6 cents; 26 to 30 count: whites, 28.6 cents; pinks, 22.8 cents; 31 count and over: whites 22.8 cents; pinks, 17.1 cents. (All values based on free rate of exchange of 17.5 sucres to US$1). Also, peeled "zebras" bring 22.8 cents a pound and peeled "titi" and "pomada" bring 17.1 cents a pound ex-vessel--the peeling is done ashore and not on the vessel.

Duties, Taxes, and Port Fees: The following duties, taxes, and port fees were in effect the latter part of 1959: export duty, 0.40 sucres per net kilogram (about 1 U. S. cent a pound); $\frac{1}{2}$ percent ad valorem for port improvement; $\frac{1}{4}$ percent ad valorem for port improvement; 1 percent on freight charges; 1 percent ad valorem on exports through Guayaquil and El Oro Province; 10 sucres per ton port fee; 1 sucre per ton statistics fee; and 0.05 sucre for each 300 pounds of shrimp for inspection and stamps. These charges total about 4.5 U. S. cents a pound. Exchange controls consist of export permits from the Central Bank, and to obtain them US$300 in currency per metric ton of shrimp exported must be sold to the

Ecuador (Contd.):

the Central Bank at the official rate of 15.00 sucres per US$1. Dollars earned in excess of the $300 may be sold at the free rate which fluctuates between 17.00-18.00 sucres per US$1. This amounts to an exchange control tax of 1.6 to 2.3 U. S. cents a pound.

Exports: Practically all exports of frozen headless and peeled and deveined shrimp are made to the United States. Exports increased from 1956 to 1959, due primarily to increased exports of smalled peeled and deveined shrimp ("titi" and "tigres"). According to estimates, these small peeled and deveined shrimp made up about 40 percent of the total exports in 1958 and 1959.

Table 1 - Ecuador's Shrimp Exports to United States 1956-58 and January-June 1959

Quantity				Value[1/]			
1959 Jan.-June	1958	1957	1956	1959 Jan.-June	1958	1957	1956
(Metric Tons)				(US$1,000)			
1,242	2,221	1,858	1,393	659	1,465	758	234

1/Values converted at official rate of exchange 15 sucres = US$1) for first US$300 of value per metric ton and at the free rate of exchange (about 17.5 sucres = US$1) for value in excess of $300 a ton.
Note: Nearly all shrimp exports are to United States; a very insignificant amount was shipped to Bolivia in 1958.

Forecast: It appears probable that Ecuador's potential production of white shrimp tails is between 3 million and 5 million pounds a year. Apparently two areas have been located where pink shrimp can be caught, but only occasional catches have been made. It is suspected though, if prices were suitable, that a fairly large amount of pink shrimp could be landed in Ecuador. (U. S. Embassy report from Mexico City, December 10, 1959.)

Egypt

SHRIMP INDUSTRY TRENDS, NOVEMBER 1959:

The only shrimp packing and freezing plant in Port Said, Egypt, was set up in November 1957. The plant, with a capacity of 20 metric tons monthly, is equipped with American refrigerating machinery. Another freezing room is under construction and is expected to increase the plant's capacity to 40 tons a month. The authorized capital of the firm is £E6,300 (about US$17,600).

The shrimp freezing plant is located just outside of Port Said near the railroad yards and backing on the Interior Basin. According to reports, the plant, although small, is clean and modern. About 200 employees (mostly women) sort, pack, and freeze the shrimp which are caught in Mediterranean waters near Port Said.

Practically all the frozen packaged shrimp are exported to the United States, except for small quantities exported to Italy, Switzerland, and France. No vessels are owned by the processing and freezing firm, but several vessels fish for the firm on a contract basis. (United States Consulate at Port Said, November 24, 1959.)

El Salvador

SHRIMP INDUSTRY EXPANDS:

Official statistical records maintained by El Salvador on the landings of shrimp are incomplete. The best estimates on the expansion of El Salvador's shrimp fishing industry can be obtained from United States Customs records. According to these records, shrimp exports from El Salvador to the United States began to increase in 1957 when 66,260 pounds were exported. In 1958 shrimp exports to the United States jumped to 1,130,000 pounds and during the first 11 months of 1959 totaled 1,546,000 pounds. Observers estimate that the total landings of headless shrimp in El Salvador in 1959 were about 2 million pounds with about 10-12 percent of the landings consumed locally or exported to countries other than the United States. The same sources estimate El Salvador's shrimp stocks (whites) to be between 3 and 6 million pounds (headless).

There are two plants (located in San Salvador and Triunfo) that freeze shrimp for export and a third plant is under construction at La Union. In July 1959, the

El Salvador (Contd.):

Government of El Salvador increased the limit on shrimp fishing vessels from 17 to 50 vessels. As of early November 1959, about 30 shrimp trawlers (all Diesel-powered) were operating out of El Salvador. Seven of the vessels were about 35 feet in length and the balance between 45 and 65 feet in length. Shrimp vessels arriving late in 1959 were modern United States-built trawlers fitted with double trawling rigs. Other vessels in the fleet are used vessels from countries other than the United States.

No information is available on ex-vessel prices for shrimp (all vessels are company owned). However, one new company is reported to be planning on paying about 30 U. S. cents under the United States selling price. On that basis, it was reported that the company would make a net profit of 1-2 U. S. cents a pound. Catches by the more modern vessels in late 1959 were averaging 3,000-5,000 pounds per seven-day trip. With the fleet increasing, it is expected that cost per pound will increase as the catch per vessel declines.

It is estimated that about 90 percent of the shrimp landings are made up of two species--Penaeus stylirostris and Penaeus occidentalis, with P. stylirostris the more abundant. The remaining 10 percent consists of a number of shrimp species. Most of the boats do not bring in shrimp that run over 25 count heads on.

The shrimp industry and the Government of El Salvador have committed themselves to a definite expansion of shrimp exports to the United States during 1960. (United States Embassy report from Mexico City, November 27, 1959.)

France

TUNA FREEZERSHIP TO OPERATE OFF FRENCH WEST AFRICA:

A fishing company of Saint Jean de Luz, France, has chartered the 10,480-ton Liberty ship Caen from the French Government for a five-year period, the November 5, 1959, issue of the Danish fishery trade periodical Dansk Fiskeritidende reports. The vessel, due to begin operation in the 1960 winter tuna fishing season, will serve as a freezership for tuna caught off French West Africa. The frozen tuna will be transported to France in the same ship.

The annual rental for the tuna freezership will be 3.5 million francs (about US$7,150) with an option for purchase.

German Federal Republic

ANOTHER NEW FACTORYSHIP STERN-FISHING TRAWLER COMPLETED:

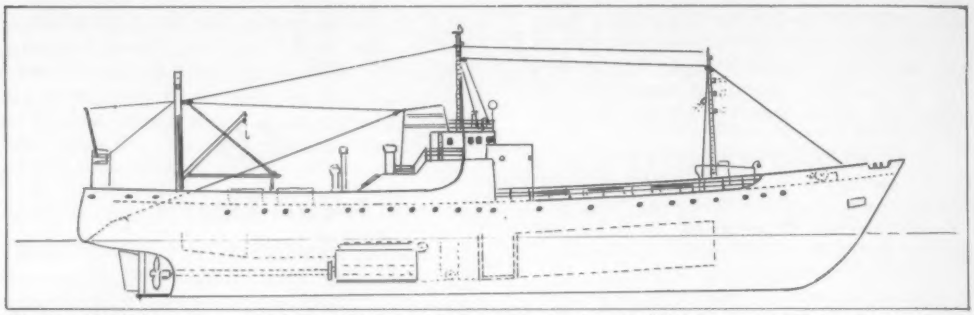
A Bremerhaven shipyard has completed the new factoryship stern trawler Carl Wiederkehr for a Bremerhaven fishery cooperative. The stern trawler Heinrich Meins was built at this yard in 1956/57 for the same owners, and it is noteworthy that considerable differences exist in the design of the new ship, as compared with its predecessor. The Voith-Schneider propulsion has been abandoned, the wheelhouse and superstructure has been moved aft to about midships, and the two 750 hp. Diesels have been replaced by one of 1,650 hp. driving a controllable pitch propeller. The over-all length of the new trawler is some 4 feet greater.

The leading particulars of the new vessel are as follows: length over-all, 220 feet 7 inches; length between perpendiculars, 189 feet; breadth moulded, 31 feet 6 inches; depth to upper deck, 23 feet 6 inches; tonnage, gross registered, 719.46; fresh fish-hold capacity, 16,529 cubic feet; deep-freeze capacity, 2,260 cubic feet; fuel oil, 30 tons; and fish meal, 55 tons.

The ship has two decks and a stern slipway, the lower deck being a freeboard deck, and it is to German Lloyd Class + 100 A 4 (E). The hull structure is built of ship's steel and welded throughout, being subdivided into 6 compartments by 5 water-tight bulkheads. The

German Federal Republic (Contd.):

superstructure consists of a small shelter for the fore hatchway and air-heating system and the main control bridge and deckhouse amidships. This houses the winch compartment, hatchways, and drying room on the upper deck, with the captain's cabin and wireless cabin above.



The Carl Wiederkehr, the second factoryship stern-fishing trawler completed in West Germany--220 feet 7 inches length over-all.

The bridge itself, including the chartroom, is so arranged to give a particularly good view astern which is especially important on stern-catching vessels.

Since the ship is built with the engine half aft, the trawl winch had to be positioned forward of the funnel within the bridge structure in order to provide the required length of deck aft, and this arrangement gives good protection to the winch against wind and weather from ahead. The top of the funnel also acts as an elevated hauling point from which the cod end and heavy trawl gear is hauled on deck, and it has been suitably designed and reinforced for this purpose.

The living accommodation is designed for 8 officers and engineers and 21 crew, engineroom, and galley personnel, and with reserves provides for a maximum of 31 persons. Officers have individual cabins, and members of the crew cabins for 2, 3, and 4 persons with associated messes and toilet facilities. The galley, with an electric oven and separate artificial ventilation, is built amidships beside the engine ventilation shaft together with provision rooms.

The catch is hauled on board via a stern slipway, and the cod end is emptied just forward of the slipway, through a compressed air-operated hatch. On either side of this hatch are two pillars connected by a cross-member, and supporting a derrick, and this is used to lift the net so that the cod end can be emptied below, before the gear is set again. Below the fish hatch are the fish gutting and sorting pounds, between which runs a conveyor belt, which first of all conveys the fish to an automatic drum-washing machine and then to a position beside the fish-room hatches in the bows, where it is automatically taken from the belt at 6 different points, and selectively passed into the various fish-room bays. On the fish-washing machine and conveyor belts use is made of "Nirosta" at all points which come into contact with the fish.

The fresh-fish room is subdivided into 12 pounds by detachable wooden transverse bulkheads, and it is insulated with glass fibre, except for the floor and a skirting one meter high where cork has been used. The fish-room floor is covered with wooden decking, and the ceiling is made of wood.

Beside the fresh-fish room, there is a small deep-freeze providing storage at -20° C. (about -18.4° F.) and intended for prime fish. The cooling system is thermostatically controlled and incorporates a center-freezing tunnel designed to accelerate cooling of the incoming fish. This room also has cork insulation on the floor and skirting, and a plant keeps the insulation permanently dehydrated.

Astern, and above the slipway, there is a gallows from which are suspended

German Federal Republic (Contd.):

the specially-designed roller-bearing gallows blocks, which can be traversed across the ship. The trawl winch has two drums holding 1,200 fathoms of trawl warp and two small drums used for hauling up the cod end in conjunction with the lifting tackles attached to the funnel.

There is also a light mast on the bridge, and another on the foredeck shelter, and these carry the radar aerial, the regulation lights, and a stay for unloading. In addition there is a small derrick on the after gallows and two 1-ton derricks on the gantry for handling trawl boards and other gear. Both anchor windlass and discharging winch are electric.

A comprehensive range of navigational and radio equipment is installed, as follows: magnetic projector compass, gyroscopic compass, automatic helmsman and D/F repeater; 1 echo-meter, 2 echo-sounders, 1 scale expander, radar; 1 long-distance short-wave transmitter, 350 watts, 1 medium and high-frequency transmitter, 1 medium-wave transmitter, 80 watts; 2 communication receivers; 1 Loran set; 1 V.H.F. sea-going radio with 28 channels, 1 radio receiver, and 1 intercommunication system.

The main engine is a Diesel developing a maximum of 1,650 hp. at 250 r.p.m. On the main shaft is a generator which can also function as a motor (300 hp.) enabling the 240 kw. developed by the Diesel winch-generator set to act as additional power on the propeller. Its chief function is as a shaft-driven generator, being normally used for powering the trawl winch motor, so that the winch Diesel is only for reserve use. A further 100-kw. shaft generator for the ship's mains is connected to the flywheel of the main engine by a vee belt. There is in addition, a 100-kw. Diesel generator and compressor set for ship's mains when in harbor. An oil-fired auxiliary boiler and an exhaust-gas boiler on the main engine supply the steam required for fish-meal and fish-oil plants and for heating.

The ship has a 3-bladed adjustable pitch propeller.

The electrical system operates at 220 volts d.c. with 380-volt 50-cycle 3-phase a.c. mains, fed via rotary converters and supplying those motors which are most liable to be endangered by damp, namely those in the fish-meal plant and the conveyor-belt plant, and the traverse motors on the gallows. In harbor, the rotary converters can also take a 3-phase feed from the shore and transform it into direct current. (World Fishing, December 1959.)

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STERN TRAWLERS OFFER ADVANTAGES:

A staff member of the Norwegian Directorate of Fisheries recently returned to Norway from a trip on the German stern trawler Karl Kempf, according to a report in Fiskaren (December 8, 1959), a Norwegian fishery trade periodical. He stated there was much to be said in favor of stern trawlers.

The vessel fished near Labrador and south of Newfoundland. It caught 190 metric tons of fish (mainly ocean perch) in $6\frac{1}{2}$ effective fishing days. Working conditions were good on the grounds and the trip was profitable even though there were no large schools of fish.

The stern trawler is safer for the crew, can fish in bad weather, and fish are taken more quickly in that one extra drag can be made daily. Work on gear on the top deck and work on the fish on the lower deck are accomplished more rapidly and with greater freedom.

Complete operating data were obtained for the 67 drags made during the trip. Fishing occurred in 190 to 200 fathoms with 500 fathoms of wire. The average time required to haul in the trawl, to empty it, and to get it back on the bottom was only $34\frac{1}{2}$ minutes.

A comparable trip will be made on a side trawler after which complete information on both types of operations will be published.

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FISHING INDUSTRY TREND IS TO LARGE TRAWLERS:

The largest West German trawlers soon will be 1,000-ton vessels, according to

German Federal Republic (Contd.):

Dansk Fiskeritidende (December 4, 1959), a Danish fishery trade periodical. Five such craft have been ordered by a group of West German fishery companies from a shipyard in Bremerhaven.

Each vessel will be 233 feet long, 34 feet in breadth, and have a fish hold with a capacity of 19,600 cubic feet. In addition, there will be an extra freezing room holding 75 metric tons of frozen fish.

For motive power the vessels will use the so-called "father and son" double motor installation with a main motor of 1,800 hp. and a smaller motor of 400 hp. The latter can drive the winch and propel the trawler alone when not coupled to the 1,800-hp. motor.

The first of the five trawlers will be ready in mid-1960. The whole series will be completed by 1961.

Vessel plans are not yet known, except that they will not be stern trawlers and will have a speed of 15 knots.

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HEAT-TREATING PROCESS FOR BACTERIA-CONTAMINATED FISH MEAL DEVELOPED:

New equipment for the sterilization of fish meal and related products infected by salmonella bacteria has been developed by two Hamburg, West Germany, firms. The new process was developed in response to the need for more effective sterilization of fish meal destined for import into West Germany. Under uniform state legislation, of which a Hamburg ordinance of February 14, 1958, forms a part, feedstuffs of animal origin may be imported into Germany only if (a) each shipment is accompanied by an official certificate (in the German language) of the country of origin to the effect that the feedstuff in question has been subjected to heat treatment or equivalent process for the killing of salmonella bacteria and (b) the feedstuff is found by health authorities at the port of entry to be free from such infestation.

The steam sterilization plant, for which German patents are pending, is designed for a continuous output of 50-300 tons per 24 hours. The meal to be disinfected is delivered to one room of the plant, from whence it is transported by conveyor belt to the hermetically-sealed sterilization chamber. From here it is passed to a packaging room in which the processed meal is put into pneumatically-sealed paper bags, in accordance with German import requirements. The possibility of reinfestation of the meal is minimized by the fact that the packaging room is completely separated from the sterilization room.

The designers of the new process state that a 150-ton capacity plant erected south of Amsterdam in the Netherlands is working satisfactorily. The cost of a plant of this size, not including boiler, is about US$125,000. An official of the Hamburg Hygienic Institute states that, although one test has revealed no salmonella bacteria in meal which was put through the new process, 2 or 3 additional tests will be required before a final judgment can be made as to its effectiveness. (U. S. Consulate report from Hamburg November 23, 1959.)

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NEW MANEUVERABLE TRAWL TESTED SUCCESSFULLY:

Trawl fishing is facing a new revolution, according to a report in Fiskaren (December 16, 1959), a Norwegian fishery trade periodical. The West German motor trawler Rendsburg during a trial trip to the Irish Sea and the English Channel tested a pelagic trawl which, like the floating trawl, can be set in any desired position in the sea. While other trawlers caught modest quantities, the Rendsburg brought in full cod ends each of the 12 days the experiment lasted.

The experimental trip was a link in the West German ocean fishery's State-supported program for seeking new fishing grounds for its fleet of 200 large trawlers. The Rendsburg fished with various new pelagic, synthetic fiber trawls developed in cooperation with the Fishery Research Institute in Hamburg.

German Federal Republic (Contd.):

Each trawl is directed by a sounding device which has an echograph on the trawl's headrope. This makes it possible for the skipper on the bridge to check the depth of the trawl, the height of the opening, and also the fish which enter the net.

The tests showed that the advanced sounding device met all the demands placed on it. The skipper also succeeded in catching herring schools, which were in the upper layers of the sea. In the same manner, pollock, mackerel, brisling, and hake, sharks, and whiting were taken in the trawl. The new method is expected to be of importance to all pelagic fishing, including both herring and other school fish which cannot now be reached by the ordinary bottom trawl or the still uncontrollable pure floating trawl.

Greece

STERN-FISHING FACTORYSHIP TRAWLER ORDERED FROM BELGIUM:

A newly-formed Greek fishing company has ordered a stern-trawling factoryship from an Ostend, Belgium, shipyard. The new vessel of 2,000 gross tons will be 246 feet in length and draw about 19 feet. The Diesel electric drive will be powered by 2,500-hp. motors of British or Dutch manufacture. The freezing machinery and equipment of British manufacture will be able to freeze 30 metric tons of fish per 24 hours. The frozen fish storage capacity will be 600 metric tons. (Aleia, a Greek fishery trade publication, of November 1959.)

Hong Kong

FISHERIES TRENDS, JULY-SEPTEMBER 1959:

The fishermen of Hong Kong during the third quarter of 1959 were generally rewarded with good catches, which were about 30 percent higher than during the third quarter of 1958. The marketing of fresh marine fish exceeded 3,600 tons in each of the three months. Long-line fishermen did not do as well as other types of fishermen, however, because of the strong currents they encountered on the fishing grounds.

The relaxation in August 1959 by the Chinese Communists of their restrictions on fishermen operating in the Pearl River estuary induced hundreds of fishing junks based in the Colony to venture out once again into these fishing grounds. A smaller portion of their catch needed to be surrendered, and they could purchase their necessities in Pearl River ports without as many formalities as before. Many of these junks had fled to Hong Kong originally to escape the strict Chinese Communist requirements for fishermen operating in the Pearl River.

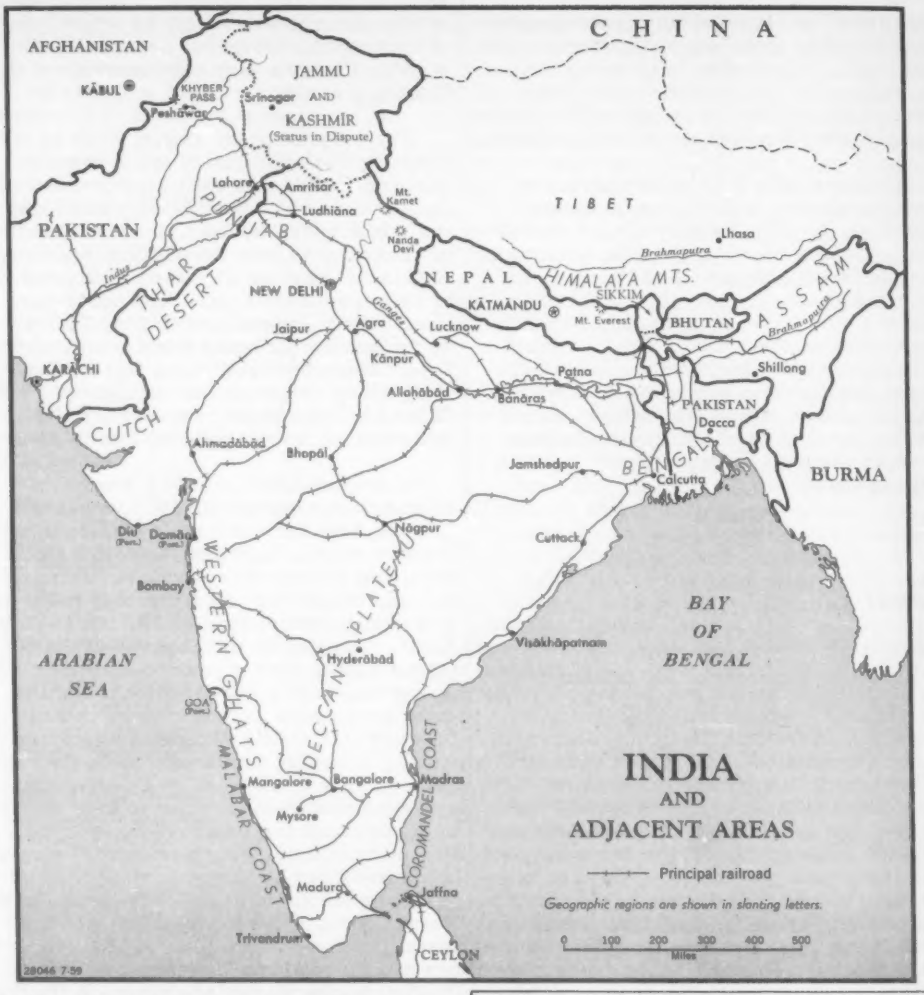
In August 1959 the Hong Kong Government earmarked HK$700,000 (about US$122,500) for the acquisition of the fishery research vessel Cape St. Mary from the British Government. The vessel was made available for only the cost of sailing it from British Guiana to Hong Kong. The vessel will cost HK$300,000 (about US$52,500) a year to operate, but is expected to locate additional fishing grounds outside Colony waters that could be worked by Hong Kong's mechanized fishing vessels, which totaled 2,420 vessels on July 1, 1959. The smaller fishery research vessel Alister Hardy, now being used by the Fisheries Research Unit of the Hong Kong University, would be turned over to the government's Department of Agriculture, Fisheries, and Forestry for closer exploration of the inshore waters, where most of the Colony's sail-powered fishermen work. (United States Consulate dispatch from Hong Kong dated January 13, 1960.)

India

GOVERNMENT DELEGATION TO SEEK JAPANESE AID IN DEVELOPMENT OF DEEP-SEA FISHERIES:

A three-member Government of India delegation was expected to visit Japan in February 1960 to explore the possibilities

India (Contd.)



of obtaining Japanese aid in the development of India's deep-sea fisheries. It is believed that India's desire to seek Japanese aid in development of Indian fisheries is due to the fact that (1) Japan is active in exploiting the fisheries of the Indian Ocean and (2) deep-sea fisheries present the best opportunity for an increase in India's landings of fish. At present India's fishery production is largely from coastal and inland waters, the United States Embassy in New Delhi reported on January 12, 1960.

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RUSSIAN FRESH-WATER FISHING EXPERT TO AID FISHERIES:

A Russian expert on fresh-water fishing was scheduled to arrive in India in December 1959 to begin a 14-months assignment as a Food and Agriculture Organization (FAO) fishing-gear technologist.

The fourth Russian fisheries expert to serve in India under FAO's technical-assistance program, he will work in

India (Contd.):

cooperation with the Indian government and FAO to improve the Indian freshwater fisheries.

The Russian expert, who worked as a scientist with the Research Institute of Marine Fishery and Oceanography in Moscow until his FAO assignment, is an expert on light fishing and electrical fishing.

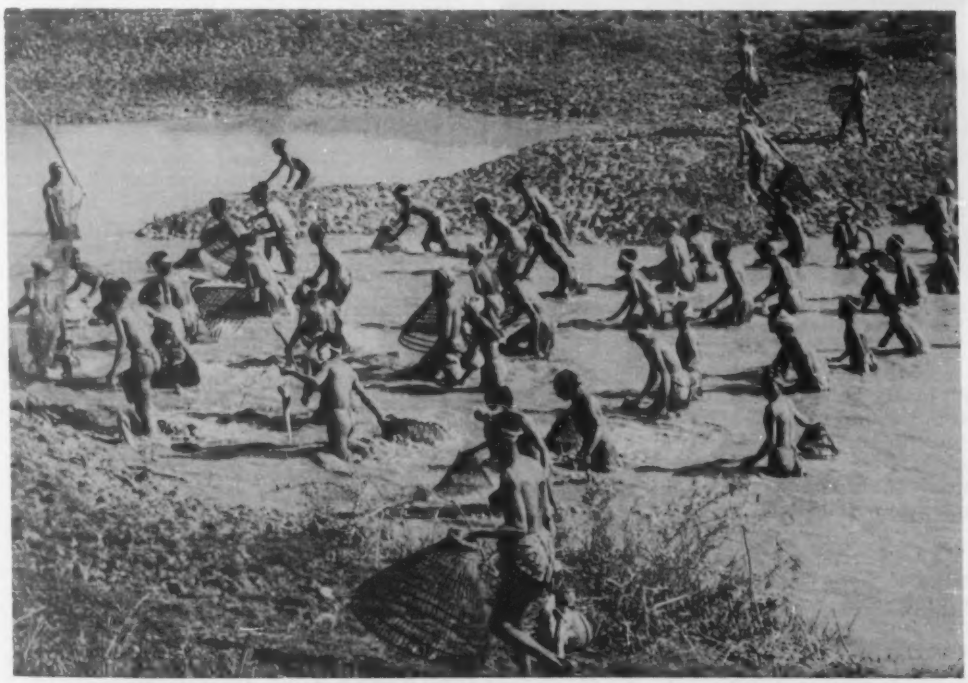
Electric lights are being used commercially with different methods by Russia in the Caspian, Black, and Okhotsk Seas, the Russian expert stated in an interview. Russians are catching 200,000 metric tons of sprat a year in the Caspian Sea by this method alone, he said.

Under this method, a fleet of 150 to 200 fishing vessels lower lamps to different depths in the sea. Fish are attracted by the lights and then are suctioned up into the awaiting boats by suction pumps.

He also stated that lights had been used in the Black Sea with irregular results. This phenomenon of why a method successful in the Caspian Sea is not successful in the Black Sea is under study by Russian scientists, he said. Fishing in the Okhotsk Sea with lights was also on a semi-experimental, semi-commercial level.

The Russian predicted that the light fishing method will eventually take over a big part in the Soviet fishing industry, and will be extended to the open ocean.

The Russian expert said he hopes to give the Indians instruction in fishing with light if local conditions permit.



Province of Assam, India. On the plains of Assam subject to flooding each year numerous bheels or ponds remain after the flood waters have receded. These bheels are often well-stocked with fish and dozens of villagers will carry out a systematic drive from one end of the bheel to another forcing the fish into a restricted space and then trapping them with inverted bamboo baskets.

Israel

MODERN VESSELS FOR FISHING FLEET:

Three large, modern vessels will be added to Israel's fishing fleet in 1960, according to the October 23, 1959, issue of the Jerusalem Post as reported in Fiskets Gang, a Norwegian fishery trade periodical. It is expected they will increase Israel's fish supply by thousands of tons annually. At present, about 23,000 metric tons are consumed in Israel of which 13,000 tons are taken in local waters and the balance imported.

Ein Gev, small harbor on sea of Galilee. Fishermen emptying their nets. Israel in recent years launched large vessels to harvest the resources of the Atlantic.

The first of the three vessels will be specially constructed for fishing in the Red Sea and the Persian Gulf and will join the small fleet of fishing craft which operate from a harbor well up in the Red Sea. The vessel will be able to freeze and store 100 tons of fish.

The second vessel will operate in the Atlantic Ocean and will join vessels fishing for a joint Israeli-Japanese tuna fishing company. This vessel will have freezing and storage space for 300 tons of fish. Tuna which reached the Israeli market from that company's first catch were received favorably by consumers. At present tuna and other ocean fish are reaching the market in limited quantities because the product is being held back in cold-storage warehouses to prevent a price decline. In this connection, poultry producers have exerted certain pressures on the Government since they contend that a flood of tuna on the market would adversely affect poultry prices.

The third vessel will operate off the coast of West Africa. This vessel also will have freezing equipment and, in addition, an installation for the manufacture of fish meal and dried fish.

Israel hopes that much of the increased catch will be exported to various Mediterranean countries, especially Italy and Yogoslavia. The local market is unable to absorb significantly more fish without a drastic cut in the imports of fish from the several Scandinavian countries. When such a reduction occurred a short time ago, it affected the exports from Israel to those countries. Scandinavian countires exchange their fish for Israel's oranges and citrus products, etc. Israel's Government has, furthermore, recently decided to increase imports of fish from Scandinavian countries.

Italy

IMPORT RESTRICTIONS LIFTED ON FRESH OR FROZEN FISH AND CRUSTACEANS FROM DOLLAR AREA:

Effective January 15, 1960, some 200 additional commodities may be imported freely into Italy from the dollar area. Included among the products freed from quota restrictions were fresh and frozen fish and crustaceans. As a result, Italian consumers may be able to buy United States goods whose importation has been curtailed for many years.

This action by the Italian Government will place United States exporters of competitive products on an equal basis in the Italian market with exporters of other countries. The complete list of products freed from quantitative import restrictions is not yet available. Removal of these limitations represents a further step by Italy in the direction of eliminating discriminatory and other quantitative import restrictions.

Jamaica

MANY FISHING CRAFT MECHANIZED THROUGH GOVERNMENT LOAN SCHEME:

The very effective mechanization of fishing boats promoted by the Fisheries Department of the Government of Jamaica, under which upwards of 500 outboard engines have been installed in fishing canoes, is stressed in a report issued by the Food and Agriculture Organization of the United Nations (FAO), Rome, Italy.

The report, which has been prepared by the Chief of the Fishing Boat Section, Fisheries Division, FAO, points out that the mechanization of Jamaican fishing craft has been made possible by the Jamaican Government Loan Scheme.

"The Fisheries Department of the Jamaican Government has imported outboard engines and made them available to local fishermen on very easy terms," the Chief of FAO's Fishing Boat Section stated at an interview held at the FAO Rome headquarters after his return from the West Indies. "The fisherman has only to make a first payment of 10 percent on the price of the engine and then has 18 months in which to pay the balance. Furthermore, he is able to buy ready-mixed gasoline free of duty, but an extra shilling (14 U. S. cents) per gallon is charged while the fisherman is paying for the engine."

The FAO expert has made a number of recommendations for the further development of fisheries in Jamaica, based on his observation of fishing craft, gear, equipment, methods and so on, during his visit to the island at the invitation of the Government. These recommendations include proposals for the design and construction of experimental types of fishing boats which, equipped with inboard engines, living quarters, and ice holds for storing fish, would be able to operate at more distant fishing grounds, staying at sea for several days; the introduction of new fishing methods; employing an engineer to investigate the possibilities for developing fishing ports and improving beach landing facilities for fishermen; and employing a gear technologist to test out new fishing methods.

"For instance, little is known at present of the bottom conditions on the distant banks and in the deep waters and I think it would be a good idea to equip some of the vessels regularly plying these waters with echo-sounders, so that observations of the bottom conditions and of the presence of fish could be reported to the Fisheries Department," the FAO expert declared.

"There is a need to consider such local conditions and to experiment with various fishing methods before a suitable new type of fishing boat could reasonably be introduced," he continued. "We have, therefore, recommended that two 35-foot prototype boats should be built to test out new fishing methods and to determine whether they are of the right design from the point of view of operation, economy of running, and so on. We have also proposed that these boats could be used, along with other craft, by a master fisherman-gear technologist to carry out experimental fishing. We are now designing the boats at the request of the Jamaican Government, and have suggested that they should be built in Jamaica, preferably with the advice and assistance of a naval architect from FAO.

"If the prototype boats turn out to be an economic proposition and point the way to bigger fish landings in Jamaica," added the FAO expert, "then they may well provide an example which could be followed by the authorities in other islands in the Caribbean."

Another proposal made is that, with the introduction of larger craft and new fishing methods, a number of young intelligent fishermen should be trained to handle the boats and carry out fishing with new types of gear and equipment. The expert concerned with the training of such fishermen would, at a later date, organize training centers to spread knowledge and technological "know-how."

In the course of his report, the FAO expert commented that the designs and shapes of the present popular fishing craft, such as the dug-out canoes, are extremely good.

Jamaica (Contd.):

"They have a sharp bow and flat run and a shape which conforms with modern ideas of hull design," he pointed out. "When they are equipped with outboard motors, the canoes sail at high speed because of their good shape. A speed of 10 knots is not uncommon. Such high speed is necessary because there is no ice-storage in the small craft.

"Unfortunately it is expensive to run craft at such high speeds because it means high consumption of gasoline," he added. "I have not said this in the report but I hope that somebody one day will develop an outboard running on kerosene or Diesel oil which would cut down running expenses."

Apart from the introduction of new boats and new fishing gear, equipment, and techniques, the FAO expert has suggested that an increased catch could be made by the use of more pots per fisherman. As he points out, power-hauling of pots in deep water might increase the number of pots operated per man. There are also possibilities of extending the life of pots by using metal frames, nylon lines, and plastic floats, if tests should prove this an economic proposition.

At present, there are estimated to be some 6,500 fishermen using 2,900 craft in Jamaica. It is believed that these fishermen land something over 7,000 tons of fish annually. This falls far short of local demand for fish and some 14,000 tons of salted cod and other processed fish are imported each year, so that there is a considerable market open to the local fishermen if they can increase their catch.

Japan

ATLANTIC TUNA EXPORTS TOP 50,000 TONS:

The Japanese Export Tuna Freezers' Association has recently issued data on actual and planned direct exports of fresh and frozen (mostly frozen) tuna from the Atlantic for the present export year (April 1959 through March 1960)--a total of 182 trips with 50,763 metric tons of tuna.

Japanese Direct Exports of Fresh and Frozen Atlantic Tuna

Destination	Number of Trips	Quantity Landed
United States (transshipments):		Short Tons
California	24	8,288
Oregon	3	489
East Coast	16	3,624
Ponce, Puerto Rico	5	1,251
Undetermined	2	1,100
Total shipped to U. S.	50	1/14,752
Direct landings in:		Metric Tons
Italy	39	11,070
Yugoslavia	39	12,545
France	20	6,341
Europe, undetermined	6	2,526
Africa	23	4,199
South America and other	5	691
Total other than U. S.	132	37,372

1/Metric equivalent about 13,391 tons.

Initial plans for this export year called for 120 trips for transshipment to the United States, but the plan has been cutback to 50 trips. (Suisan Tsushin, December 24, 1959.)

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EXPLORATORY TUNA FISHING IN CARIBBEAN SEA:

In December 1959, information on exploratory tuna fishing operations by the Japanese Fisheries Agency's research vessel Shoyo Maru (600 tons) in the Caribbean Sea was released.

The vessel fished six times in six days and obtained average catches of 3 tons a day. Catches comprised yellowfin, albacore, big-eyed, and species of swordfish. The ship used 200 baskets of long line for each setting.

After completing exploratory fishing operations, the vessel was expected to visit Ponce, Puerto Rico, then proceed to Samoa, via the Panama Canal. After exploring fishing grounds between New Zealand and Australia, the vessel was scheduled to return to Japan in March 1960. (Fisheries Economic News, December 24, 1959.)

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Japan (Contd.):

FROZEN TUNA EXPORTS, 1959:

The Ministry of International Trade and Industry has revealed Japan's 1959 frozen tuna exports (including transshipments to the United States from an intermediate port and direct landings in foreign countries) amounted to about 152,000 metric tons.

Exports by country of destination were: American Samoa 12,000 tons, New Hebrides 3,000 tons, Italy 12,000 tons, France and Dakar 10,000 tons, Yugoslavia 10,000 tons, Argentina 500 tons, the United States 100,000 tons (albacore 30,000 tons and yellowfin 70,000 tons), and other countries 4,500 tons.

Exports of yellowfin tuna were heavy in 1959 as compared with the previous year. Also exports to Yugoslavia were considerably greater.

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EXPORT QUOTA FOR FROZEN ALBACORE MAY NOT BE MET:

The Japan Frozen Food Exporters' Association has opened the frozen albacore tuna export quota for the period January-March 1960, and the quota for the export year is to be 30,000 tons, as originally planned. In opposition to the common-sense opinion that the 30,000-ton goal cannot possibly be attained because of the poor summer albacore catch, the opinion is heard in some quarters that the quota can be filled by a heavy production of long-line albacore frozen aboard the fishing vessels, without dependence on pole-and-line albacore tuna catches.

According to this way of thinking, the number of tuna long-liners, which was 140 in 1958, rose to 190 in 1959, and there has been about a 30 percent increase in the number of boats fishing the Indian Ocean albacore grounds. Catch rates have also risen, and it is held that exports of 15,000 tons are possible in the period from December 1959 to March 1960, as compared with 11,200 tons in the same period last year. Actual exports up to December 1959 were about 13,000 tons, and if transshipments from the Atlantic and exports of loins made from the winter albacore catch are taken into the calculation, it is claimed that the 30,000-ton quota can definitely be filled. If this is so, then the evaluation of the albacore pole-and-line fishery that has prevailed hitherto will change markedly, and with the desire for increased production of canned albacore, it is conceivable that the near future may see a rational division of the catch, with bait-boat fish being taken by the canners and with long-line fish going to the freezers.

Many persons, however, estimate that frozen albacore exports for the export year will end up at about 25,000 tons, figuring that the 30,000-ton quota cannot be filled with long-line frozen fish (including mothership fish) unless monthly landings for the next three months average 4,000-5,000 tons, while it is generally estimated that they will be at most about 60 percent of that.

In any case, it is a fact that the relative importance of shipboard-frozen fish in frozen albacore exports has increased greatly since 1958, and if the poor summer albacore fishing continues another year, there is no room for doubt that long-line frozen albacore will come to occupy a predominant position. (Nikkan Suisan Tsushin, December 21, 1959.)

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FROZEN ALBACORE TUNA EXPORT QUOTA FOR JANUARY-MARCH 1960 ESTABLISHED:

As a result of discussions at a meeting of the Steering Committee of the Japanese Export Frozen Tuna Fisheries Association, 6,000 short tons was established as the quota for frozen albacore tuna for the period January-March 1960.

Shipments of frozen albacore increased since December 1, 1959, and as of December 15 amounted to some 2,800 tons. At and around the end of each year, landings become heavy. A number of tuna vessels were expected to be back from the Indian and Atlantic Oceans with a total of about 5,000-6,000 tons by the end of 1959, and it is natural to expect that exports too will increase. For exports to the United States, prices are quoted

Japan (Contd.):

as $310-320 per short ton f.o.b. (Fisheries Economic News, December 23, 1959.)

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PROSPECTS FOR WINTER ALBACORE TUNA FISHERY POOR:

Northeastern Japan canners were helped financially in 1959 with the skipjack tuna season, but lost money on summer albacore tuna and saury. During the late fall of 1959, they were pinning their hopes on the winter albacore fishery, but judging from the catches up to December, good catches cannot be expected, and it is predicted that high prices will prevail because of a scarcity of fish. Two vessels from Kesennuma were fishing in early December, along with 3 or 4 Mie Prefecture vessels, but the grounds off Chosi and the more southerly grounds were showing signs of poor fishing, and it is expected that the tuna canners will suffer from high prices due to a scarcity of raw material.

Cormorant fishing on the River Nagara

Each year the winter albacore season extends from late November to March, but in 1959 the Mie Prefecture fleet was late in going fishing, as were the Yaizu, Shimizu, Izu, and Miyagi fleets, and it looked as if it would be the middle of December before all would be active. At the end of November, a 140-gross-ton vessel and a 169-gross-ton vessel from Kesennuma sailed to find albacore, and depending on their results, 3 or 4 more vessels were due to sail. As of December 15, 35 vessels from Mie Prefecture, 20 vessels from Shizuoka Prefecture, and 15 vessels from Miyagi Prefecture were expected to be live-bait fishing for albacore. The fishing grounds 700 to 800 miles east of Choshi, which produce winter albacore in normal years, were not yielding the expected catches, and fish were also scarce in the Midway area, on which the larger vessels had been placing their hopes.

In the face of these pessimistic indications, the canners appear to have nearly given up their hope of making up for the poor summer albacore catch by means of the winter fishery. At the port of Kesennuma this year, the price of summer albacore was US$328 to $354 per short ton, and the canners, whose break-even point is said to be $275 a ton, lost $76 per ton on their raw material cost. Adding the cost of labor, packing, and storage, raw fish bought at $313 a short ton meant a loss of $1.95 to $2.25 a case, it is said.

According to reports reaching Japanese canning circles, the U. S. albacore fishery took about 30 percent more fish in 1959 as compared with 1958 and American fishermen reduced their price. This situation in the United States has been reflected in a weakening of demand from the American market. In any case, export albacore canning cannot help losing money on both the summer and winter albacore fisheries. Furthermore, because of the three years of poor albacore catches in succession, vessel owners are changing their ideas about albacore pole-and-line fishing, and it looks as if the winter albacore fishery, as an off-season employment for skipjack vessels, may be at a turning point. (Nippon Suisan Shimbun, December 9, 1959.)

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WINTER ALBACORE TUNA FISHERY TRENDS, DECEMBER 1959:

Because mackerel-pike fishing continued good at a remunerative price in December 1959, the shifting of Japanese fishing vessels to winter albacore fishing was delayed. Also, vessels from Shizuoka Prefecture, with the exception of a few, which ordinarily play an important part in the winter albacore fish-

Japan (Contd.):

ery were preparing to sail for the more stabilized yellowfin fishing areas in the South Pacific. Albacore fishing vessels actively fishing in the 1959/60 winter were expected to be less than the number that fished a year ago.

A large California canner was reported actively buying frozen albacore in December 1959. The Japanese export market has maintained a strong tone and climbed to $310 from $290 a short ton f.o.b.

Some of Japanese tuna vessels were returning from the Indian Ocean in December with a fairly good quantity of albacore tuna. The mentioned packer is reported to have purchased about half of those landings--2,500-3,000 short tons. (Excerpts from several news stories in Japanese Press.)

As of mid-December a total of 20 tuna vessels were fishing albacore tuna near Madagascar in the Indian Ocean--10 from Misaki and Tokyo, 5 each from Shizuoka and Mie Prefectures. The average daily catch by each vessel was 4-5 metric tons. The size of the fish caught was getting larger. These vessels were expected to be back in Japanese ports in February.

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WINTER ALBACORE TUNA PROSPECTS IMFROVE BUT PRICES STILL HIGH:

Although it was reported that this winter's Japanese live-bait albacore tuna fishing around 27° N., east of 160° E. was very poor, considerable hope was held for the long-line fishing around 30° N. It was expected that landings from that area would increase after mid-January.

The trends for this season are: (1) the bait-boat albacore which usually start landing around December 20 did not show up at all, and although about 20 boats from Mie and Shizuoka Prefectures were on the grounds, there was no report of their catching fish; (2) on the other hand, the albacore long-lining south of the Kii Peninsula, which usually begins to produce catches in January, began producing landings in the last 10 days of November 1959, and through December an average of 20 tons a day was landed at Katsuura and Yaizu.

The boats from northeastern Japan, which do the greater part of the winter bait fishing, were slow in shifting from saury fishing, and were not expected to be in full operation until the end of December 1959. Boats from Kagoshima, Tosa, and Wakayama, which usually enter the albacore long-line fishery after the latter part of January, were reported to have stopped yellowfin tuna fishing on southern grounds and to be planning to enter the albacore fishery earlier this year. According to the Tokai University Fisheries Laboratory, prospects are poor for the albacore bait-boat fishing off northeastern Japan.

The fish landed by long-liners in December 1959 were large--40 to 55 pounds each--and their quality was good, so that they were suitable for Japanese canners. The ex-vessel price was 125 to 135 yen per kilogram (US$316 to $339 per short ton). With the export price at US$310 to $320 f.o.b. Japan, the freezers could not buy fish at prevailing ex-vessel prices.

Because the Japanese canners were disappointed in the skipjack tuna catch off northeastern Japan in the autumn of 1959, they were looking to the winter albacore fishery to supply them with raw material after they finished tangerine packing. It was reported that they were already stocking up on long-line albacore and frozen clipper fish, so informed sources believe that the albacore ex-vessel price will hold up even if the winter long-line fishery has good catches. (Suisan Tsushin, December 23, 1959.)

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TUNA FISHERY TRENDS, 1959:

The Japanese 1959 summer albacore tuna season (which was also very poor in 1958) ended with an unprecedentedly low catch, causing considerable concern to Japanese tuna fishery interests. This fishery, which is carried on from April to July, would in ordinary years produce landings of about 40,000 metric tons at

Japan (Contd.):

its most important base of Yaizu, but in 1958 only half that amount was landed, and in the summer of 1959 only about 10,000 tons were landed. Because of the poor fishing prospects, ex-vessel prices rose steeply the latter half of the season and reached 160 yen a kilogram (US$405 a short ton).

In spite of the high prices, most of the combination bait-boat long-liners made little money. Most of the vessels gave up albacore fishing early and switched to the skipjack tuna fishery. The unreliability of albacore fishing resulted in a decline in the number of vessels operating in that fishery. This meant there was insufficient scouting of the offshore grounds and the schools were not located.

A large number of tuna long-liners moved to the Atlantic grounds. In recent years all fishing grounds of the Indian Ocean and the Pacific have been thoroughly exploited, catch rates are trending steadily downward, and operating costs are steadily rising. The vessels operating in the Atlantic engage in direct exporting and their operating costs are reduced. Late in 1959 a number of vessels from Shimizu and Yaizu went to the Atlantic.

In 1959 there was a tremendous growth of the fish-sausage market in Japan. Since tuna is used in that product, it has added another level of demand for tuna and has contributed importantly to the stabilization of the tuna fishery. It is hoped that similar new uses for skipjack tuna can be found in order to stabilize the price of that fish, which has fluctuated considerably because it is used largely for the traditional dried skipjack products. (Suisan Keizai, December 27, 1959.)

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PROPORTION OF ALBACORE IN ATLANTIC TUNA CATCHES CLIMBS SHARPLY:

Japanese Atlantic tuna fishing operations have from the beginning produced mainly yellowfin tuna, but the latter part of 1959 a sharp increase in the proportion of albacore in the landings has attracted attention. One vessel with a catch of 200 tons in December had 90 percent albacore, and another which landed 350 tons had 70 percent albacore. (Suisan Tsushin, December 28, 1959.)

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RESEARCH VESSEL TO EXPLORE TUNA RESOURCES OFF WEST AFRICA:

The Japanese Fisheries Agency's research vessel Shoyo Maru (604 tons gross) this year will explore the tuna resources off the Dakar and Gold Coast areas of West Africa. The vessel has finished her explorations in the Caribbean sea and was expected to return to Japan in March 1960, exploring tuna resources in the South Pacific and around Australia en route. Upon her return, she was expected to go into drydock for overhaul and will begin her next long cruise in August 1960.

The budget for the Shoyo Maru's operations off West Africa has already been determined, and will finance 87 days of explorations. She will survey an area off the Gold Coast between 10° N. and 10° S., 5° E. to 30° W. and other West African areas at 15° N. to 25° N., 20° W. to 40° W. In each of these areas 25 long-line stations will be fished.

In addition to exploring the fishing grounds, the Shoyo Maru will determine market conditions and advertising possibilities for consumption of tuna products in France, Italy, Yugoslavia, and Egypt. Her schedule calls for departing Tokyo August 1, proceeding via Colombo to Capetown (September 11), to the Gold Coast area and Dakar (October 20), to other West African areas, and thence to Marseilles (November 11), Venice, Rijeka, Port Said, Suez, Singapore, and back to Tokyo (January 19, 1961). (Suisan Keizai, December 27, 1959.)

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TUNA VESSELS FISHING IN CAROLINE-MARSHALL ISLANDS AREA:

About 45 small Japanese vessels were fishing for tuna in the South Pacific around the Caroline and Marshall Islands in mid-December 1959, according to an

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announcement by the Fisheries Research Institute, Tokai University. Catches were made up of small or medium size yellowfin tuna. The actual fishing area was around Palau. A belt of water with temperatures of 28.7°-29.2° C. (83.7°-84.6° F.) was formed around Truk and Ponape and fishing became more intense there. Also along the east coast of Australia in the Coral Sea, good fishing was reported with yellowfin, big-eyed, and white marlin mixed in catches. Likewise, yellowfin and big-eyed fishing east of 125° west longitude, south of 5° south latitude was noticeably improving at that time. (Fisheries Economic News, December 12, 1959.)

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RULES FOR LICENSING CANNED TUNA EXPORTS TO THE U. S.

The Japanese Ministry of International Trade and Industry announced these rules for licensing canned tuna exports to the United States during January-November 30, 1960.

(1) Canned tuna exported to the United States is limited to tuna in brine, tuna spreads, and animal foods.

(2) The quantity to be licensed for export will be in proportion to actual records of canned tuna (in brine, in oil) exported to the United States, January 1, 1950-December 31, 1955.

(3) The quantity will be converted to the equivalent of tuna No. 2 cans (7 oz., 4 doz. to case). Can sizes other than No. 2 will be converted as follows: Tuna No. 1 cans, 2 doz. to case=0.94; tuna No. 3 cans, 4 doz. to a case=0.48; tuna 2 kilo (4.4-lb.) cans, half dozen to case=1.16.

Destinations: 50 states of the United States, District of Columbia, Puerto Rico, Virgin Islands, Panama Canal Zone, Guam, American Samoa, Wake, Midway, Canton Island, and Enderbury Island. (Fisheries Economic News, December 7, 1959.)

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TUNA INDUSTRY PLANNING SKIPJACK FISHING OFF BRITISH NORTH BORNEO:

A large Japanese company has revealed a plan to establish a tuna-fishing base on Shamil Island, about 60 miles east of Tawao in British North Borneo. This project is said to have originated from the mission of Japanese fisheries, mining, paper, and oil men to North Borneo in May 1959. The Japanese company has, since May, been in touch with the local authorities in North Borneo, who are said to be actively favoring the project. Officials of the company's export and canning departments were expected to go to North Borneo to conduct final negotiations.

As reported in Tokyo, the plan calls for establishing a cannery capable of producing 500 cases of canned tuna a day together with cold-storage facilities. Five 40-ton live-bait tuna vessels are to be sent to the base initially, and a production of 8,000 to 10,000 metric tons of skipjack tuna a year is envisioned. The business will be carried on by a Japanese corporation, the product will be almost entirely exported to the United Kingdom and the United States, and the local Government will derive benefit from the operation through export duties.

Waters off Shamil Island are known to the Japanese tuna industry as rich year-round skipjack grounds from experience before World War II, when there was a small Japanese tuna fishing base there. (United States Embassy, Tokyo, December 11, 1959.)

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FISHERY LANDINGS HIGHER FOR FIRST HALF OF 1959:

The Japanese Ministry of Agriculture and Forestry in its January-June 1959 report showed total landings for Japan-based fisheries of 2,120,000 metric tons, a 3-percent increase over the corresponding period of 1958 and the highest of the past seven years. Major species showing important increases were mackerel scad (46 percent), Alaska pollock (23 percent), skipjack tuna (54 percent), bluefin tuna (100 percent), and common squid, which hit a new high of 44,144 tons, about 1.8 times the January-June 1958 landings. On the other hand, there was a decline in production of sardines (13 percent), anchovy (22 percent), Atka mackerel (40 percent), and sand launce (34 percent). Albacore landings were 25,276 tons or 26 percent below the first six months of 1958 poor landings, because of the failure of the summer live-bait fishery. The skipjack tuna catch of 85,450 tons represented a further increase over

Japan (Contd.):

the January-June 1958 unusually large landings of that species and set a new record. Japan-based landings of yellowfin tuna were down 3 percent to 41,496 tons, the second year of decline after five years of steady increase, reflecting the shift of many large tuna boats to the Atlantic, where they land or transship their catches in or to foreign ports.

Despite the poor early summer albacore catch, the live-bait tuna fishery's over-all catch for January-June 1959 of 97,285 tons was up 11 percent as compared with the same period of 1958. Total landings from the tuna long-line fishery were 155,670 tons, 12 percent above January-June 1958 and more than double the 1953 production. The spring herring fishery in Hokkaido, which has been declining rapidly in recent years, was an almost total failure, and herring production for the period was only 15,268 tons. As a consequence, dried herring roe, a traditional Japanese New Year's dish, was selling at the unheard of price of 500 yen (about US$1.40) per 100 grams (about 0.22 lbs.).

There was not much general change in fish prices during the first half of 1959. The over-all average price for all species in the wholesale markets of the six largest cities was up about 4 percent to 11 U. S. cents a pound, while the corresponding average price in the markets of 83 producing areas was down about 3 percent to 6 U. S. cents a pound. Prices for herring, anchovy, and saury rose; sardine and round herring held steady; and mackerel scad and mackerel were lower than in 1958. Among the tuna species, skipjack at 6.5 U. S. cents a pound ($130 a short ton) was down 22 percent, bluefin at 26.6 U. S. cents a pound ($532 a short ton) was up 11 percent, albacore at 13.7 U. S. cents a pound ($270 a short ton) was up 14 percent and yellowfin at 11.7 U. S. cents a pound ($234 a short ton) was 11 percent higher than in 1958. Fresh and salted salmon prices were up by 22-36 percent, shrimp was up 8 percent, oysters were up 14 percent, and gelidium seaweeds, the raw material for agar-agar, were 42 percent higher than during the first six months of 1958.

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STERN TRAWLERS PLANNED FOR FISHING OFF AFRICA AND AUSTRALIA:

The Shimonoseki Branch of a large Japanese fishing company has announced that as part of its 1960 operating plans it will build two 1,500-ton stern trawlers and will enter upon the development of new fishing grounds off Africa and Australia. Two other large fishing companies have also been announcing various plans for the construction of large trawlers for fishing in new distant areas. This is the result of crowding on the grounds of the East China Sea and restrictions in the North Pacific salmon fishery. Since the company building the two large stern trawlers has been heavily engaged in North Pacific salmon fishery, restrictions in that fishery have had an adverse effect on its operations.

The company is expected to ask the Japanese Fisheries Agency for permits to build these two stern trawlers early this year. Construction will cost about 600 million yen (US$1,680,000); the trawlers will be started in March, launched in May, and completed in June. (Suisan Keizai, December 27, 1959.)

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NEW FISH-MEAL FACTORY-SHIP FOR BERING SEA:

The fish-meal factoryship Soyo Maru (10,900 tons gross), which a Japanese fishing company has under construction at Sasebo, Japan, was scheduled to be launched on January 15 and completed by mid-March. With the construction of this ship, there will be four fish-meal factoryships operating in the Bering Sea in 1960--Kinyo Maru, Renshin Maru, Soyo Maru, and Gyokuei Maru. (Suisan Tsushin, December 26, 1959.)

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FACTORYSHIP DUE TO BEGIN EXPERIMENTAL OPERATIONS FOR PACIFIC HERRING IN APRIL:

A Japanese factoryship herring fishery will be started in April 1960 in the North Pacific. The industry is laying plans to carry out a Bering Sea-Bristol Bay experimental herring fishing operation on a small scale when the fish meal factoryships begin fishing in April. The plan is to send out 2 or 3 herring fishing boats with the four fish-meal fleets scheduled for operation in 1960 and carry on herring fishing in addition to the usual fishery for bottom species for reduction into fish meal.

The Japanese have not fished for the Bristol Bay herring in the 14 years since the war and the fishery is at present an unknown quantity. Therefore, although it is known that herring occur there, nothing is known of their abundance. For this reason, the companies will carry on experimental operations in connection with the fish-meal fleets, rather than organize special herring fleets, and depending on the results of the experimental fishing, this fishery may take a place as the third northern Pacific fishery. (Suisan Keizai, December 18, 1959.)

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FROZEN CUTTLEFISH EXPORTS TO ITALY:

Five firms in Hokkaido, Japan, are reported to have succeeded in concluding

Japan (Contd.):

an agreement to export 500 metric tons of frozen cuttlefish worth about US$83,333 to Italy. The first shipment was expected to be made early in 1960. Frozen cuttlefish will be used for bait in Italy. (Fisheries Economic News, December 17, 1960.)

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SHRIMP INDUSTRY:

Japan has produced in recent years from 47,000 to 55,000 metric tons of shrimp annually, of which about 5 percent has been exported. The shrimp landings comprise many species and represent for the most part incidental catches from a variety of fisheries. There does not seem to be any possibility of a great increase in production and export of shrimp from the domestic fisheries.

Shrimp Fishery: Although more than a dozen species of shrimp are caught by Japanese fishermen, the only distinction made in the statistics of the Ministry of Agriculture and Forestry is between the "kuruma" shrimp, Penaeus japonicus, and "other shrimp." Shrimp is an important incidental catch in a variety of Japanese trawl fisheries, but there is no fishery of any importance primarily devoted to catching shrimp. Shrimp landings are reported from all of the coastal Prefectures of Japan and are recorded in the catches of 16 different types of fishing gear, all of which also take other kinds of fish. For example, the East China Sea trawl fishery is an important producer of large shrimp, the "taisho-ebi" (Penaeus orientalis), but even during the peak winter season only 30-40 percent of its catch is shrimp.

Table 1 - Japanese Shrimp Landings and Value, 1956-58 and First Eight Months of 1958-59

Year	"Kuruma" Shrimp		Other Shrimp	
	Metric Tons	US$ 1,000	Metric Tons	US$ 1,000
Jan.-Aug. 1959	1,516	1/	38,696	1/
Jan.-Aug. 1958	1,492	1/	30,343	1/
1958	2,784	5,502	52,679	21,526
1957	2,051	3,820	45,427	19,699
1956	2,306	4,281	47,917	18,381

1/Value unavailable.

Shrimp are produced by a variety of trawl fisheries, employing vessels of many types and sizes, from less than 5 tons to over 100 tons gross. The number of powered vessels in the classes that can be regarded as potential shrimp producers is more than 36,000. Nearly half of the Japanese shrimp catch is, however, taken by vessels of the category called "small powered trawlers etc." There are approximately 11,500 vessels in this category in the Inland Sea region, which accounts for about 40 percent of Japan's total shrimp catch. Nearly all of these vessels are smaller than 5 tons gross, and about 8,000 of them are under 3 tons.

Recent Japanese statistics show no trend of marked increase or decrease in the numbers of vessels in any of these categories of trawlers which catch shrimp in Japan, nor are there any organized plans for constructing or decommissioning important numbers of such vessels.

Prices: According to a Japanese Fisheries Agency source, it costs about 8,000 yen (US$22.40) per ton to freeze shrimp. Refrigerated storage charges run around 9.8 yen (2.7 U.S. cents) per 10 kilograms (22 lbs.) for 15 days at -10°C., (14°F.) and 30 percent more at -20°C. (-4°F.). This is said to be an average charge, but cold storage charges vary greatly depending on demand.

A large number of species and sizes are landed and several species are regularly marketed both alive and dead, with the live shrimp commanding a premium price. As with other fish and shellfish landed in Japan, sales are by bid and the prices vary considerably from day to day and also between various lots offered on the same day.

The average price of large "kuruma" shrimp in the Tokyo market in July 1959 was 62 U.S. cents a pound (headless). January 1960 wholesale prices at the Osaka market for this species were about 350-600 yen per kilogram (44-75 U. S. cents a pound), but the Tokyo price is running about 95 U.S. cents a pound for headless shrimp. According to monthly average price data for the past two years, the price of this shrimp in mid-winter is generally about two or three times the mid-summer price.

January 1960 prices for the "kuma-ebi" (Penaeus monodon), another large species of shrimp, at Tokyo and Osaka wholesale markets were approximately the same as for the "kuruma." Other wholesale prices were 70 to 90 U. S. cents a pound for the "shiba-ebi" (Metapenaeus joyneri), 23 to 38 U.S. cents a pound for white shrimp (Pasiphaea sirado), and 8 to 16 U.S. cents a pound for red shrimp (Penaeopsis akayebi).

Catches in the East China Sea and Yellow Sea 1959/60 winter fishery for "taisho-ebi" are so far only about 10 percent of the 1958/59 winter's catch, and the ex-vessel price was averaging 68 U.S. cents a pound. At this price level, it is said that all of the shrimp is sold on the domestic market, and these shrimp cannot be profitably exported until the price drops to about 50 U.S. cents a pound (headless), according to trade sources.

In 1958 the average prices for the year in the markets of the producing areas were 91 U.S. cents for "kuruma" shrimp and 19 U.S. cents a pound for other kinds of shrimp. Corresponding prices for the wholesale markets of the six largest cities were 95 U.S. cents and 47 U.S. cents a pound.

On December 8, 1959, the first deliveries of the season of "taisho-ebi" to the Tokyo central market sold at 83 U.S. cents a pound for large (6 to the pound) and 51 U.S. cents for small (11 to the pound) shrimp.

Shrimp Exports: According to the Japan Frozen Food Exporters' Association, average export prices in October 1959 were US$1,440 a short ton for "taisho-ebi", US$1,300 for "prawns," US$1,298 for "shrimp," and US$1,116 for cooked and peeled shrimp. These prices are very close to the respective averages for these categories for the period April to October 1959, and prices have reportedly not changed greatly since October 1959. According to the Ministry of International Trade and Industry, the over-all average frozen shrimp export price for the period from January-October 1959 was US$1,393 a short ton, as compared with US$1,251 for the same period of 1958.

Table 2 - Japanese Exports 1/ of Frozen Shrimp by Country of Destination, 1956-58

Country of Destination	1958		1957		1956	
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
United States	2,660	1,679	2,492	1,551	2,336	1,381
Hawaii	22	19	34	27	28	18
Ryukyus	48	42	36	31	36	18
Hong Kong	-	-	2	2/	10	2
Canada	14	4	44	24	2	2/
United Kingdom	608	378	-	-	-	-
Australia	108	61	-	-	-	-
Other	24	21	22	13	-	-
Total	3,484	2,204	2,630	1,646	2,412	1,419

1/Total exports for Jan.-Oct. 1959 amounted to 6,438,000 lbs., valued at US$4,458,580.
2/Value less than $500.

Japanese exports of dried shrimp have declined in recent years, canned shrimp exports show no particular trend, but exports of frozen shrimp, after rising gradually from 1956 to 1958, appear to have increased considerably in 1959. This may reflect the good catch of "taisho-ebi" in the East China and Yellow Seas in the winter of 1958/59, and if this is the

Japan (Contd.):

Table 3 - Japanese Exports 1/ of Dried Shrimp by Country of Destination, 1956-58

Country of Destination	1958		1957		1956	
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
United States	78	47	78	51	88	55
Hawaii	157	98	113	77	132	80
Ryukyus	4	1	5	1	16	5
Hong Kong	44	11	82	18	100	31
Taiwan	571	164	614	185	639	187
Other	55	33	23	10	36	18
Total	909	354	915	342	1,011	376

1/Total exports for Jan.-Oct. 1959 amounted to 716,000 lbs., valued at US$272,370.

case, exports may decline again if the poor catches of the early part of the 1959/60 season continue. At any rate, it appears that despite the strong domestic demand for shrimp in Japan, there is a considerable quantity available for export when market conditions are favorable.

Summary: Shrimp production from Japan-based fisheries has increased in recent years, but the increase has not been spectacular. There are probably no important shrimp resources in areas accessible to Japanese-based vessels that are not already under intensive exploitation, and therefore no great increase in the landings is anticipated. The most likely way in which the large Japanese trawling fleet could contribute to an important increase in the world's supply of shrimp would be for some of the Japanese fishing industry's plans for foreign-based operations--in such areas as the Mexican west coast, the Bay of Bengal, or Venezuela--to materialize.

An interesting plan for the large-scale culture of the large shrimp (Penaeus japonicus) in abandoned salt beds of the Inland Sea is scheduled to be put into operation in 1960, under the technical direction of the former research chief of the Japanese Fisheries Agency. It is claimed that an economically feasible method has been perfected for raising "kuruma" shrimp from the egg to marketable size, and the promoters reportedly plan on attaining an annual production of 3,000 tons at the end of three years and of 10,000 tons after the project has been under way for five years. A large part of this production is intended for export. (United States Embassy report from Tokyo dated January 11, 1960.)

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FISH-CULTURE COMPANY TO RAISE SHRIMP:

A Japanese fish-culture company, jointly financed by two large Japanese fishing companies, is expected to begin operations in April 1960 to raise "kurumaebi" (a species of shrimp), with a former Fisheries Agency director as its president. The company expects to produce about 240 metric tons in about half a year from a brood stock of about 24 tons of shrimp. The shrimp are for domestic consumption and for export to the United States. (Suisan Tsushin, December 15, 1959.)

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SHRIMP FISHING VESSELS SOLD TO MEXICO:

Two Japanese shrimp fishing vessels, the No. 8 Hajime Maru (110 tons gross) and the No. 16 Myojin Maru (160 tons gross) departed Japan for Mexico in mid-November 1959. They sailed from Hawaii on December 23 and were scheduled to reach Acapulco in mid-January for delivery to a Mexican firm under the supervision of a Japanese trading firm. A Japanese fishing firm was asked by two Japanese trading companies to procure the two vessels and sail them to Mexico.

The initial arrangement was a sales contract for the two shrimp vessels, and the terms of the contract would be fulfilled with delivery of the vessels in Mexico. However, the Japanese fishing company that sailed the vessels has been asked by a Japanese businessman and the Bank of Tokyo to take this opportunity to enter into an operating agreement with Mexicans, and about January 10 the Director of the Japanese fishing company was expected to go to Mexico. Depending on the results of his investigations, the Japanese fishing company is said to be inclined to undertake the operating agreement (Suisan Tsushin, December 24, 1959).

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PET FOODS MADE OF FISH EXPORTED TO UNITED STATES:

Japanese exports of pet foods (made mostly with tuna) to the United States were up sharply in 1959. As of November 30, 1959, exports amounted to more than 400,000 cases, far in excess of the 200,000 cases shipped in 1958.

The price towards the end of the year was about $5.00 a case f.o.b. Japan. Exporters in Japan indicate that sales contracts will double again in 1960. (Fisheries Economic News, December 19, 1959.)

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TRAWLERS FISHING IN NEW AREAS:

Because of difficulties and restrictions on trawling west of 130° east longitude, the Japanese trawler industry is seeking new trawling areas.

Japan (Contd.):

Trawling west of 130° is a fishery centered around the East China Sea west of 135° east longitude, but it is under an unstabilized operational condition, affected by relations with Red China. The catch by large trawlers is steadily declining in the area, i.e., the catch of 17,600 tons in 1958 was 2 percent less than the previous year and 45 percent less than in 1953.

Under the circumstances, one of the large Japanese fishing companies withdrew its large trawlers from the South China Sea and west of 130° east longitude and sent them to operate along the northwest coast of Australia (two vessels of the 500-ton class) and west coast of Africa (one vessel of the 1,000-ton class). Some of the catch caught off Africa is being landed in Greece. This same company plans to build a trawler of the 2,000-ton class in 1960 at a cost of about US$1,388,889 and operate it in the Atlantic.

Another Japanese company sent large trawlers of 500 tons to 1,000 tons to Argentina, Australia, New Zealand, and Africa. This company is operating joint undertakings mostly with local interests, and in 1960 it intends to build more trawlers of the 1,000-ton class.

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U.S.S.R. MAY PROPOSE ENLARGEMENT OF NORTHEAST PACIFIC SALMON TREATY AREA:

In December 1959 the Japanese Government informed the Soviet authorities that Japan hopes to open the fourth annual meeting of the Japan-Soviet Fisheries Commission on February 2, 1960, and at the same time presented the Japanese section's proposed agenda. The U.S.S.R. has unofficially expressed an intention during the negotiations to take up the questions of enlargement of the treaty area in the northeast Pacific and illegal operations by Japanese fishing vessels. This intention on the part of the U.S.S.R. has not been confirmed.

An informed Japanese source had the following to say about this report: "In the first and second years' negotiations, arguments on conservation and on the sharing of the harvest were developed within the framework of 100,000-metric-ton and 80,000-ton quotas, but at the third annual conference in 1959, Prime Minister Kishi, speaking for the Japanese side, proposed to accept an 80,000-ton quota in 1960 in return for a 90,000-ton quota in 1959, and thus the Japanese side itself destroyed the former basis of negotiations. This produced conditions under which it would be natural to consider that the boundaries of the treaty area might be changed, and there will be nothing strange about the U.S.S.R.'s making such a proposal. From the point of view of conservation of the resource, the present treaty line is nonsense. However, when it comes to talking about the division of the harvest, more importance should be attached to the decision of the Soviet authorities to close all salmon fishing in Kamchatka." (Suisan Tsushin, December 28, 1959.)

Mexico

EXPORT DUTIES ON PACIFIC COAST SHRIMP AND SPINY LOBSTERS REVISED:

Effective January 1, 1960 (Diario Oficial, December 31, 1959), Mexico lowered export duties on fresh shrimp and on frozen shrimp originating from the Pacific (with the exception of Salina Cruz, Oaxaca, and Santa Rosalia, Baja California, which follow the rates for the Gulf of Mexico) and increased export duties on spiny lobsters. The new rates were effected by changes in the official prices from 1,700 pesos to 1,223 pesos per 100 net kilograms (about 61.8-44.4 U. S. cents a pound) for shrimp and from 12.20 pesos to 13.50 pesos per gross kilogram (about 44.3 to 49.0 U. S. cents a pound for spiny lobsters. The new rates in terms of United States cents are as follows:

Item	New Rate	Old Rate	Difference
	(U. S. Cents a Pound)		
Shrimp, fresh or iced, net weight	11.337	15.754	-4.417
Shrimp, frozen, net weight	2.131	2.926	-0.795
Lobster, spiny, fresh, iced or frozen, gross weight	3.611	3.274	+0.337

Practically all of Mexico's shrimp exports (about all frozen) are exported

Mexico (Contd.):

to the United States. It is estimated that about 67 million pounds of frozen shrimp were exported to the U. S. during 1959. The present decrease was granted at the request of the West Coast industry which had been complaining of losses due to the decline in the United States market.

Spiny lobster exports, which normally run around 2 million pounds a year, are also practically all to the United States. Most of the lobsters come from Baja California and the majority are exported cooked whole in ice.

Note: See Commercial Fisheries Review, November 1958, p. 81.

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WEST COAST SHRIMP INDUSTRY ASKS FOR GOVERNMENT AID:

Contrary to the somewhat optimistic outlook made earlier in 1959 for Mexico's west coast shrimp fishery, the industry almost reached the point of financial stagnation at the end of 1959 due primarily to (1) an approximate 35-percent decrease in prices in the United States market and (2) an increase in the proportion of small size shrimp in the catches. Late in 1959 some small shrimp-producing firms in northern Sinaloa ports were forced to tie up their boats and larger operators in Guaymas and Mazatlan who claimed to be losing from 2,000-3,000 pesos (US$160-240) a metric ton were reported ready to tie up their fleets if Federal Government assistance was not forthcoming soon.

Shrimp processors, the fishing fleet owners, and others directly interested in the industry held urgent meetings in November 1959 in an effort to determine ways and means to continue shrimp fishing operations in the northern Gulf of California. They were in general agreement that assistance would have to come from the Federal Government in the form of (1) a temporary cancellation or reduction of the ad valorem export tax on shrimp; (2) a reduction in the price of Diesel fuel which was increased sharply this year; (3) relief from contracts with fishermen's cooperatives requiring that an established sum be paid for shrimp catches; and/or (4) a direct subsidy. Petitions to the Federal Government were made for such assistance and there was some indication that serious consideration was being given to them in Mexico City.

The Mexican shrimp industry seemed to realize that it could help itself, however, by agreeing to limit its catches to larger-size shrimp as it became apparent that the change in the closed season in 1959 had not been helpful in producing increased numbers and larger sizes of shrimp. (U. S. Consulate report from Nogales, December 31, 1959.)

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WEST COAST SPINY LOBSTER CATCH DOWN FROM 1958/59 SEASON:

The spiny lobster fishery (season from October 1 to March 15), located in Mexico's State of Baja California, got off to a slow start this season and expectations are that the 1959/60 catch will be considerably below that of 1958/59. As of mid-January 1960, the catch was estimated to be down 20 percent. The reasons for the low catch are: (1) storms and general bad weather; (2) the fact that there was a delay in obtaining permits from the proper governmental authorities; (3) an alleged delay in receipt by the fishery cooperatives of credit from the Banco de Fomento--an allegation, however, which the bank says is not accurate; and (4) alleged lack of interest on the part of the fishermen because of their large debt to the bank. They are said to be reluctant to go out because they feel they have nothing to gain.

The Regional Federation of Fishing Cooperatives (Federacion Regional de Cooperativias Pesqueras) who do almost all the lobster fishing have an indebtedness of some 9 million pesos (US$721,000) to the Banco Nacional de Fomento which is to be gradually paid off by deductions from receipts from the sale of lobsters. In addition, each year at the beginning of the season the cooperatives must borrow further sums for equipment and supplies. This year the bank reports that 80 percent of the sums borrowed have been amortized. (United States Consulate dispatch from Tijuana, dated December 24, 1959.)

Morocco

FISHERY TRENDS, FOURTH QUARTER 1959:

At the beginning of the fourth quarter of 1959, Operation Fish (the Moroccan Ministry of Health campaign to increase domestic fish consumption) was extended from Rabat to Casablanca. The drive started with much publicity on October 10, 1959, with speeches and public appearances of officials, roving loudspeakers, and great quantities of fish at ten cents a kilo (4.5 cents a pound). The initial momentum was reduced somewhat a few days later when the supply of fish ran out. However, by the end of November, Casablanca was taking deliveries of ten tons a day. Increased domestic sales should do something to solve the dilemma of the fishing industry whereby the export of fresh fish is strictly limited because the canners fear that the fish will be canned overseas and thereby reduce their own sales, and on the other hand, not enough markets can be found for either Moroccan canned or fresh fish.

The industry was also helped by the October devaluation of the Moroccan franc. The 650,000 unsold cases of sardines reported in the third quarter of 1959 are said to have been sold along with all of the catch of this season. While devaluation has eased sales, the long-run effects cannot yet be clearly seen.

While canned sardines remain the basic element in the Moroccan fishing industry, signs are increasing that more diversification is taking place. Fish byproduct plants are taking up to 70 percent of the catch in Agadir. It has been announced that edible fish meal has been put on sale in all the pharmacies in the country. More mackerel is being canned and sold on the local market, and plans are being made to increase foreign sales.

The total fish catch in 1959 was not spectacular. Storms drove the fish away from Agadir and Essaouira into regions farther north such as Safi, where the fishing was good until late in 1959. Although quantity was good, quality was not up to previous canning standards.

Another tuna net (madrague) has been installed, this one in the Tangier region,

at Cap Negra. There are now ten fixed tuna nets operating off the Moroccan coast. (United States Embassy report from Rabat.)

Netherlands

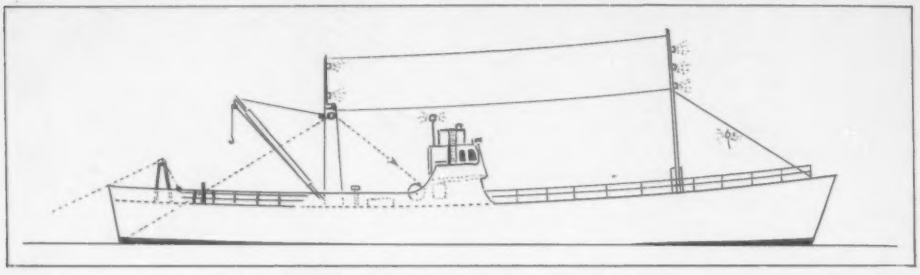
TWO STERN FISHING TRAWLERS ORDERED FROM SHIPYARD:

A Dutch shipyard at Landsmeer has received an order for the construction of two stern-fishing trawlers. The ships will have the following dimensions: length over-all, 163 feet 9 inches; length between perpendiculars, 143 feet 8 inches; breadth 27 feet 11 inches; depth to maindeck, 20 ft. 4 inches; and depth to tweendeck, 13 feet 6 inches.

The keel of the first vessel has been laid; this vessel is scheduled for launching early in 1960. It will be powered by

Netherlands (Contd.):

twin Diesel engines, each developing 500 hp. They will drive controllable-pitch propeller through a reduction gearbox. The hydraulically-driven trawl winch will be placed abaft the wheelhouse and the fishing gear will be hauled from gallows placed at the stern. Living accommodation will be provided for a complement of 15.



New Dutch stern-fishing trawler--163 feet long; Diesel powered.

When hauling the net the danlenos will come up to the quarters under the gallows. The net is then lifted by the trawl winch with a heaving line running through blocks fitted to the crosstrees, the net being brought to the upper deck via a ramp at the stern. A hatch in the upper deck is then opened, through which the fish reaches the working deck below.

Each of the two samson posts aft is fitted with a heavy derrick which enables the net to be lifted up still further, so that all the fish is emptied out. They also serve to position the net in readiness for shooting. Cleaning and sorting of the fish is carried out on the second deck, a conveyor belt being installed for the transport of the fish to the forward part of the vessel, where hatches give access to the fish hold. A processing plant will be installed on the tweendeck and there is enough room for the installation of a fish-meal plant.

The correct positioning of the gallows, the blocks, and further equipment for the rapid hauling and shooting of the net is still being studied. A scale model has been made with the aid of which the builders in cooperation with a number of trawler skippers can finalize the fishing procedure. Although it is known that certain difficulties encountered abroad have been solved after many experiments, the adoption of foreign systems is not always feasible as Netherlands trawlers generally use different types of nets, while in addition, the foreign systems and forms of stern are patented. (World Fishing, December 1959.)

Norway

GOVERNMENT AID TO COD FISHERMEN FOR 1960 REDUCED:

Representatives of North Norway's cod fishermen's organizations and the Norwegian Ministry of Wages and Prices reached an agreement in December 1959 on the amount of Government aid to be extended to the cod fishermen of the area during 1960. Under the terms of the agreement, the Ministry will seek an appropriation of 10 million kroner (US$1.4 million) to support the prices received by the fishermen and an appropriation of 2 million kroner ($280,000) to finance certain marketing expenses of the marketing organizations. It was further agreed that the Government will subsidize 20 percent of the cost of the fishing tackle expenses and 10 percent of the cost of the bait. Finally, it was agreed that the Government would raise the guaranteed minimum wage from 75 kroner (US$10.50) to about 100-125 kroner ($14.00-17.50) per week, and that it will abolish the turn-over tax on the sale of fish and fish products. The cod fishermen are reportedly somewhat dissatisfied

Norway (Contd.):

Medium-size dual-purpose commercial fishing vessel at dock, Os, Norway.

with the amount of the aid, but it was approved by Norges Raafisklag.

In 1959 the Government supported cod prices with an appropriation of 34 million kroner (US$4.8 million). According to an official of the Ministry of Fisheries, the total value of Government aid to North Norway cod fishermen in 1960 (price supports plus subsidies, etc.) will be about 28 million kroner (US$3.9 million), the United States Embassy in Oslo reported on December 24, 1959.

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HERRING FISHERMEN RECEIVE MORE AID:

Representatives of the Norwegian herring fishing industry and officials of the Ministry of Prices and Wages have recently reached agreement on prices for the catch and the amount of Government aid during the 1960 herring fishing season. Because of the failure of the herring fisheries in 1958 and 1959, the fishermen are in a difficult financial position and consequently demanded more support than in previous years.

The following are the main points of the agreement: buyers will pay the same prices as in 1959, but the fishermen will be permitted to draw 20 million kroner (US$2.8 million) from the Price Fund for price supports--the fishermen had drawn 16 million kroner (about US$2.2 million) in 1959 and sought 35 million kroner (US$4.9 million) in 1960; the Government for the first time will subsidize part of the costs of repairs and equipment--the amount of the subsidy will be 20 percent; and the fisherman's minimum wage, which is guaranteed by the Government, will be increased from 75 to 100 kroner (US$10.50 to 14.00) a week. According to an official of the Ministry of Fisheries, the agreement met the demands of the fishermen by only little more than half. (U. S. Embassy report from Oslo, December 18, 1959.)

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REPORT TO PARLIAMENT OUTLINES VITAL NEEDS OF FISHERIES:

Recommendations for policies to guide the future development of Norwegian fisheries were the subject of a two-day debate in Parliament in December 1959. Speakers of all parties expressed general support for the Fisheries Committee's report on the comprehensive proposals drafted by the Brofoss Commission. The Fisheries Minister also received considerable backing for his views

Norway (Contd.):

which on several points differed from those of the Parliament's Fisheries Committee. In his statement to Parliament, the Fisheries Minister said a series of Government bills would be drafted to incorporate some of the proposals for short-range measures to help fishermen and the fishing industry.

The debate was opened by the Laborite chairman of the Fisheries Committee and manager of the report on the Brofoss Commission recommendations. The most important points in the committee report were as follows:

1. The target of the fisheries policy should be to assure fishermen an adequate annual income, preferably above the income level in other industries. The long-range objective should be to create a profitable fishing industry without state support. But during the transition period it would be necessary to provide suitable subsidies.

2. It is of the greatest importance for the fishing industry to obtain easier credits, lower operating expenditures, and more liberal tax arrangements.

3. In order to assure continuous supplies of raw materials for the frozen fillet industry, loans and condemnation subsidies are required to make the present fishing fleet more modern and efficient, without a general expansion.

4. To equalize the supply of raw material in poor fishing periods, the regular fishing fleet should be supplemented with specially-built ocean-going vessels, including trawlers.

5. In certain districts it is necessary to establish fishing firms which will use trawlers and other special vessels to procure raw materials in distant waters.

6. Parallel with these proposals for the fishing industry, concerted efforts should be made to develop other industries in the coastal districts of Norway.

In his statement to Parliament, the Fisheries Minister maintained that the traditional coastal and seasonal fisheries in coming years would offer little or no possibility for increasing the profitability or the production of the fishing industry. Future opportunities, he declared, lie in fisheries in distant ocean areas. But this will require larger vessels, including trawlers, and a start towards acquiring experience in this type of fishing.

He also said, scientific investigations indicate that the failure of Norway's coastal fisheries in recent seasons was principally caused by a reduction in the influx of fish. For that reason, he argued, modernizing the present fishing fleet could not be counted on to increase the coastal fish catch. The solution is to acquire a fleet of ocean-going fishing vessels, especially large trawlers.

The Fisheries Minister expressed great confidence in the future opportunities for Norway's postwar developed fish fillet industry, especially in view of the acceptance of frozen fish as tariff-free products within the "Outer Seven" free trade area. In this connection, the minister declared it should be feasible to double the combined output of Norway's fish-filleting plants from 25,000 to 50,000 metric tons a year. Such an expansion would in large measure solve the problem of seasonal unemployment in coastal districts. But if domestic vessels are unable to supply enough raw material for the filleting plants, he warned, it may become necessary to consider whether to permit foreign fishing vessels to deliver their catches in Norwegian ports.

Many speakers agreed that a gradual switch to trawlers and other large fishing vessels would be highly desirable. At the same time, however, modernization of the coastal fishing fleet should not be neglected. The Fisheries Committee asserted that the fish catch could be increased by rationalizing and modernizing the coastal fleet. It was emphasized that the Committee by no means was opposed to an expansion of deep-sea and year-around fisheries. The committee report gives a green light to the frozen fish industry to acquire larger vessels, including trawlers, if these prove to be more profitable. (News of Norway, December 17, 1959.)

Panama

SHRIMP INDUSTRY:

Panama's shrimp fishery (shrimp exports rank second in value of all Panamanian exports) has been undergoing some severe tests during 1958 and 1959. Like the United States, Mexico, and Ecuador she overbuilt her fleet during the 1956-58 boom. One of the particular inducements was the excellent run of pink shrimp early in 1957. The industry was expecting even a better run in 1958, but it failed to appear in that year and in 1959. The failure of the pink shrimp run in 1958 and 1959, coupled with the price break in the United States market, has caused considerable retrenchment in Panama. The fleet has been and is continuing to be reduced, and several of the freezing companies have combined or are combining their operations to reduce production costs. It is believed that most of the shrimp vessel owners currently are losing money.

Over half the 1958 exports were peeled and deveined "titi" (seabobs and another smaller species). Owing to price problems very little "titi" as of mid-November 1959 were being processed.

Panamanian boats in September 1959 encountered, off Punta Mala, pink shrimp in areas suitable for trawling in depths of 35-40 fathoms. Catches were good, 3,000 - 5,000 pounds of heads-off per 7-day trip, but prices have not been satisfactory. In the past the pink shrimp fishing season has been from December to March or April.

Landings: Panamanian landings include heads-off white shrimp and heads-on and heads-off pink, titi, and tiger shrimp. There is no precise breakdown according to the categories listed.

Table 1 - Panama's Landings and Value of Shrimp, 1956-58 and January-June 1959

Year	Landings (All Species)	Value	Landings by Variety 1/		
			White	Pink	"Titi" and Tiger
	1,000 Lbs.	US$ 1,000	....(1,000 Lbs.)....		
Jan.-June					
1959	7,496	2,844	2/	500	2/
1958	10,071	4,936	3,600	500	6,000
1957	9,268	5,465	4,000	2,300	3,000
1956	6,645	2,503	4,100	800	1,700

1/Estimated. 2/Unavailable.

With the intense fishery that has been going on in Panama for the past several years it appears that the white shrimp potential, providing those years are representative, does not exceed about 4 million pounds a year.

The species breakdown of white shrimp landings runs approximately as follows: 80 percent Penaeus occidentalis; 15 percent P. stylirostris; and about 5 percent P. vannamei and P. californiensis.

Shrimp Fishing Fleet: As of mid-November 1959 there were reported to be 161 shrimp trawlers in Panama. This is a decline of about 50 boats from the peak number fishing in 1958. Industry sources claim that there are less than 150 boats actually fishing. It is expected that about 16 boats will soon depart for operations in Colombia and perhaps a few to Nicaragua. The Panamanian shrimp fishing fleet increased from 10 vessels in 1950 to a high of 205 vessels in 1958.

All vessels are Diesel-powered. About 25 vessels are between 40-50 feet. All of the newer vessels run 60 feet in length and it is estimated that there are more than 100 in that class. The remainder are between 50 and less than 60 feet in length.

During the latter part of 1959 there were no shrimp vessels being built in Panama. Panama has had two very lean years as far as shrimp vessel operations have been concerned and the shrimp fleet started to decline around mid-1958. If shrimp prices continued to hold at November 1959 levels, the number of vessels in the fleet was expected to decline still more.

Shrimp Processing Costs: Production costs for shrimp in Panama vary considerably depending upon the quantity handled and the efficiency of the plant. For white shrimp the costs are as follows: ex-vessel price 65 U.S. cents a pound. Unloading, carting, grading, packing, and freezing, 6-10 cents a pound; and for cartons, cases, and strapping, 2.5 cents a pound. Shipping costs from Panama City are about 3.65 cents a pound and from Cristobal about 3.25 cents a pound (gross weight). Total cost of frozen shrimp aboard ship at U. S. port is about 80 U. S. cents a pound.

Ex-Vessel Shrimp Prices: Ex-vessel prices for Panamanian headless white shrimp were 65 U. S. cents a pound. Practically all of the white shrimp fall in the three top sizes--20 and under count. The price for pink headless shrimp was 35 cents a pound up to mid-November, but dropped to 33 cents a pound at the end of November 1959. The ex-vessel price for headless "titi" shrimp was 10 U.S. cents a pound.

The above prices are paid according to the type of shrimp. No differential in price is made according to the size of the shrimp. Processors, however, are now trying to discourage the vessels from bringing in the smaller sizes of pink shrimp because the processors are losing money on counts over 35 shrimp to the pound.

Export Prices: The export prices as of November 20, 1959, f.o.b. Panama for five-pound packages (jumbled pack) were: white shrimp headless 80 U.S. cents a pound for shrimp under 20 count to the pound. Practically all of Panama's landings and exports of white shrimp are 20 count and under; pink shrimp, headless, 60 U.S. cents a pound for 16 to 20 count with a 5-cent drop for each smaller size group to 30 cents for 50 to 60 count; "titi," peeled and deveined, a flat 35 U.S. cents a pound.

The Government of Panama, on the advice of a FAO fishery research expert, has set up, staffed, and equipped a marine fishery research station where research on Panama's shrimp resources is being carried out. FAO expert catching shrimp samples in a mangrove swamp.

Table 2 - Panama's Frozen Shrimp Exports to United States, 1956-58 and January-June 1959

Jan.-June 1959 1/		1958		1957		1956	
1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
5,029	2/	8,084	5,614	8,263	6,181	5,977	4,427

1/From United States import data; other figures are from Panama export data.
2/Not available.
Note: Export value f.o.b. Panama in U. S. cents per pound: 1958--69.44; 1957--74.84; 1956--74.14.

Exports: The Panamanian official export statistics approximate fairly closely the United States import data. Dur-

Panama (Contd.):

ing 1958, Panama exported about 230,000 pounds more shrimp than originated in Panama. It is estimated that about 130,000 pounds of shrimp from Colombia and 100,000 pounds from Nicaragua were processed in and exported from Panama to the United States in 1958. (U. S. Embassy dispatch, dated November 30, 1959, from Mexico.)

Peru

EXPORTS OF MARINE PRODUCTS, JANUARY-SEPTEMBER 1959:

Exports of principal marine products by Peru in January-September 1959 amounted to 242,265 metric tons (valued at US$31.4 million). Fish meal exports (184,090 tons) for the first nine months of 1959 were up about 140.0 percent as compared with the same period of 1958 and 379.6 percent as compared with January-September 1957. Exports of marine products other than fish meal were also up sharply during January-September 1959.

Peruvian Exports of Principal Marine Products, January-September 1959

Product	July-September 1959			January-September 1959		
	Quantity	Value1/		Quantity	Value2/	
	Metric Tons	Million Soles	US$ 1,000	Metric Tons	Million Soles	US$ 1,000
Fish meal	60,510	193.2	6,834	184,090	583.9	21,341
Fish (frozen, canned, etc.)	13,275	81.4	2,879	30,483	197.8	7,230
Fish oil	6,888	19.4	686	13,814	36.3	1,327
Sperm oil	3,873	12.7	449	7,904	26.3	961
Fertilizer (guano)	3,044	7.2	225	3,449	8.2	300
Whale meal	700	2.4	85	2,525	7.8	285
Total	88,290	316.3	11,188	242,265	860.3	31,444

1/F.o.b. values converted at 28.27 soles equal US$1 for 3rd quarter of 1959.
2/F.o.b. values converted at 27.36 soles equal US$1 for the first nine months of 1959.

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SHRIMP INDUSTRY:

Landings: The Peruvian fishery for salt-water shrimp is limited to a narrow strip about 30 miles long near Tumbes, off the northern tip of the country. A survey of the shrimp resources made in 1955 predicted that the area could produce from 600,000 to 900,000 pounds of heads-off shrimp annually. Fresh-water shrimp taken from lakes and streams are consumed entirely in Peru. In 1958 the estimated landings of heads-off salt-water shrimp amounted to about 509,000 pounds, or about 32.8 percent below the 758,000 pounds landed in 1957, but 31.2 percent higher than the 1956 landings of 388,000 pounds. Heads are removed on board the vessel.

Exports: Practically all of Peru's landings of heads-off under 20 count size shrimp are exported to the United States. Exports totaled 503,000 pounds in 1958, 736,000 pounds in 1957, and 359,000 pounds in 1956.

Exports of fishery products from Peru are subject to permit issued by the Bureau of Fish and Wildlife of the Ministry of Agriculture, and licensing by the Ministry of Finance and Commerce. In practice such authorizations are readily obtainable for most fishery products. Export taxes are as follows:

Law No. 10545, April 16, 1946 (amending Article 1 of Law 9506): 10 percent ad valorem tax on the difference between officially-fixed production cost per short ton of 907.184 kilograms, net weight, and the price in the United States (Pacific coast), less freight and insurance. (Average prices as reported by Peruvian consuls in the United States to the Peruvian Ministry of Finance and Commerce).

Law No. 9466, December 18, 1941: Additional 10 percent ad valorem tax on all export products, applicable when export price exceeds by 25 percent the officially-fixed production costs (payable on the excess). Calculation of production costs for tax assessment purposes: For the assessment of export taxes according to Laws Nos. 10545 and 9466, the following basic production costs are currently used:

	Production cost per short ton of 907.184 kg., net weight (Soles)
Frozen shrimp ("Langostinos") - Supreme Resolution, Sept. 4, 1953	Soles 9,300 (US$339.45)

Law No. 7540, June 30, 1932 (Unemployment tax): 1 percent ad valorem tax on all exports from Peru.

Law No. 10811, March 3, 1947: 2.00 soles (7.3 U.S. cents) per metric ton gross weight. (Payable on exports from all Peruvian ports).

Supreme Decree of March 6, 1942 (As amended by Supreme Decree No. 71, July 22, 1955): All exports through the ports of Callao, Matarani, and Mollendo are subject to the payment of a port charge of US$1.60 per metric ton, weight or volume. Exports through other Peruvian ports pay a charge of US$0.30 per metric ton, weight or volume.

Law No. 11537, December 18, 1950: 2 percent tax on the cost of ocean freight, as shown in the bill of lading. Applicable on all exports.

Fishing Fleet: As of November 1959 there were only two companies with a fleet of 13 vessels engaged in the Peruvi-

Table 1 - Peru's Landings and Exports of Heads-Off Shrimp, 1956-1958

Year	Landings			Exports			
	Quantity	Value		Quantity	f.o.b. Value		
	1,000 Lbs.	Million Soles	US$1,000	1,000 Lbs.	Million Soles	US$1,000	U.S.¢/lb.
1958	509	4.8	196	503	4.5	184	80.7
1957	758	6.1	321	736	5.7	300	89.8
1956	388	2.4	126	359	2.2	116	71.2

Note: Values converted to US$ as follows: 1958, 24.49 soles equal US$1; 1956 and 1957, 19.0 soles equal US$1.

Peru (Contd.):

Table 2 - Peruvian Production Costs of Frozen Shrimp, November 1959

Cost1/	Soles/Metric Tons	US$/Metric Tons	US¢/lb.
Ex-vessel price	21,000	766.51	34.8
Packing	1,000	71.18	3.2
Labor for packing	1,500	54.75	2.5
Freezing & ice used on vessels	1,300	47.45	2.2
Export duties	3,900	142.35	6.5
Total	29,650	1,082.24	49.2

1/Estimated for under 20-count size shrimp.
Note: Peruvian soles converted to US$ at rate of 27,397 soles to US$1.

an shrimp fishery--6 of the vessels are 40-42 feet and 7 are 36-38 feet in length. The shrimp vessels are all equipped with Diesel engines of 50-105 hp. The fleet of shrimp vessels was built in Peru and are all Peruvian-flag vessels. There are no plans at present for building any new shrimp vessels.

Production Costs: Costs of producing frozen heads-off shrimp for export in November 1959 were about 49.2 U.S. cents a pound in Peru. Dockside cost of the headless shrimp was 34.8 U.S. cents a pound, and other costs including containers, labor, freezing, export duties, and the ice supplied to the vessels, amounted to 14.4 U.S. cents a pound, or almost US$982 a short ton. Costs for ocean freight, warehousing, and handling costs at the U. S. port of entry, and broker's commission of about 7-1/2 percent amounted to 19.3 U.S. cents a pound.

Philippines

USE OF FLOATING FISH CANNERIES AND VESSELS RECEIVED FROM JAPAN:

The Philippine Legislative Committee on Good Government has revealed that the two floating fish canneries received as part of Japanese reparations payments late in 1958 from Japan have never been used. The investigation by the Committee brought out that the floating fish canneries plus six fishing vessels had been awarded to an Iloilo farmers' cooperative marketing association and that the cooperative had no plans to use the equipment. The fish canneries and the six fishing vessels are valued at about US$2,250,000.

As a result of the investigations, the Reparations Commission Chairman has announced the withdrawal of the award of the vessels to the cooperative and that they would be awarded to concerns able to utilize them properly. He also announced that several Philippine firms were interested in removing the canning equipment from the two floating fish canneries for use in establishing canning plants ashore. The two large vessels would then be converted for use in the interisland trade

Four of the six fishing vessels have been completed by the Japanese and in December 1959 were anchored in Tokyo Harbor because the farmers' cooperative lacked the funds to bring them to Manila. (U. S. Embassy Report from Manila, December 18, 1959.)

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NEW FISHERY RESEARCH VESSEL ACQUIRED FROM JAPAN:

Philippine officers and crew members were in Japan early in January 1960 to take delivery in February of the first fishery research vessel built in Japan (built under Japanese reparations payments) for the College of Fisheries of the University of the Philippines. The crew will take special training in the operation of the vessel and its laboratories.

A separate group of the University faculty members has been touring Japan and other countries to study the administration and curriculum of fishery colleges, fish processing laboratories and plants, and fishery market cooperatives. It is hoped that these endeavors will give new impetus to the Philippine deep-sea fishing industry.

The research vessel is the first of two being built in Japan for the Philippines. The other, which is expected to be delivered in the near future, will go to the Government's Bureau of Fisheries. (U. S. Embassy Report from Manila, January 8, 1960.)

Portugal

CANNED FISH EXPORTS, JANUARY-SEPTEMBER 1959:

Portugal's exports of canned fish during January-September 1959, amounted to 51,804 metric tons (2,830,000 cases), valued at US$26.6 million, as compared with 43,410 tons, valued at US$23.1 million, for the same period in 1958. Sardines in olive oil exported during the first

Portugal (Contd.):

nine months of 1959 amounted to 37,662 tons, valued at US$18.2 million.

Portuguese Canned Fish Exports, January-September 1959

Species	Metric Tons	US$ 1,000
Sardines in olive oil	37,662	18,213
Sardine & sardinelike fish in brine	1,127	228
Tuna & tunalike fish in olive oil	3,199	2,241
Anchovy fillets	4,870	3,566
Mackerel in olive oil	2,909	1,443
Other fish	2,037	942
Total	51,804	26,633

During January-September 1959, the leading canned fish buyer was Germany with 11,429 tons (valued at US$5.7 million), followed by Italy with 7,497 tons (valued at US$4.3 million), United States with 5,158 tons (valued at US$3.5 million), Great Britain with 4,485 tons (valued at US$2.1 million), and France with 3,219 tons (valued at US$1.6 million). Exports to the United States included 1,996 tons of anchovies, 783 tons of tuna, 2,242 tons of sardines, and 37 tons of mackerel. (Conservas de Peixe, November 1959.)

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CANNED FISH PACK, JANUARY-SEPTEMBER 1959:

The total pack of canned fish for January-September 1959 amounted to 37,498 metric tons as compared with 35,632 tons

Portuguese Canned Fish Pack, January-September 1959

Product	Metric Tons 1/	1,000 Cases
In Olive Oil:		
Sardines	26,932	1,417
Sardinelike fish	544	28
Anchovy fillets	4,343	434
Tuna	4,065	145
Mackerel	533	21
Other species	1,081	57
Total	37,498	2,102

1/Net weight.

for the same period in 1958. Canned sardines in oil (26,932 tons) accounted for 71.8 percent of the January-September 1959 total pack, up by 23.2 percent from the pack of 21,866 tons for the same period of 1958, the November 1959 Conservas de Peixe reports.

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FISHERIES TRENDS, JANUARY-SEPTEMBER 1959:

Sardine Fishing: During January-September 1959, the Portuguese fishing fleet landed 69,765 metric tons of sardines (valued at US$6,994,224 ex-vessel or about $100 a ton).

September 1959 landings of sardines totaled 24,523 tons valued at US$2,158,504. Canneries purchased 59.3 percent, or 14,553 tons, of the sardines (valued at US$1,415,443 ex-vessel or about $97.26 a ton) during September 1959. A total of 9,572 tons was purchased for the fresh fish market, and 398 tons were salted.

Other Fishing: The January-September 1959 landings of fish other than sardines were principally 22,944 tons of chinchards (value US$1,514,817) and 3,032 tons of anchovies (value US$276,591). (Conservas de Peixe, November 1959.)

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TUNA FISHERY LIMITED TO FEW TRAPS AND TWO MODERN CLIPPER-TYPE VESSELS:

The Portuguese landings of tuna are derived primarily from five coastal fish traps located along the Algarve coast and two modern 840-gross-ton clipper-type vessels which fish in the Atlantic and land wherever there is a market. Catches of tuna are landed at several ports, but primarily at Villa Real de Santo Antonio and Tavira. The traps (4 are near Tavira and 1 near Cape Santa Maria) are fished from May to August, or during the period when the bluefin tuna are migrating to and from the Mediterranean. The tuna clippers have been converted from Diesel-powered submarine chasers and fish the year-around. These two vessels often land catches in Italy and France.

The tuna landings are almost entirely canned in the Villa Real de Santo Antonio area. The canners purchase foreign-caught tuna when supplies from the Portuguese fishermen are not available. (U. S. Embassy Report from Lisbon, December 18, 1959.)

South-West Africa

PILCHARD-MAASBANKER FISHERY TRENDS:

The busiest and most successful season in the ten-year history of the South-

South-West Africa (Contd.):

West Africa Walvis Bay pilchard fishing industry closed at the end of October 1959 with a record catch of 300,000 short tons.

The South-West Africa catch added to the record total of the South African fishery brings the total pelagic shoal fish catch for the Union and South-West Africa in 1959 to 642,000 short tons, 86,000 tons higher than the record catch of 1958.

According to reports from South-West Africa, 3 of the 6 processing factories reached their quotas and closed down early in October, 2 had closed down by the middle of the month, and the sixth was expected to reach its quota at the end of October.

The September catch was 49,703 tons of which 154 tons were maasbanker. This catch yielded 6,179,000 pounds of canned fish, 10,876 tons of fish meal, and 2,317 tons of fish-body oil. (The South African Shipping News and Fishing Industry Review, November 1959.)

Spain

COD FISHING INDUSTRY:

For many years one of the staple foods of Spain has been salted and dried cod. Many examples can be seen in that country of stone troughs in which the Phoenicians salted fish.

The early history of the Spanish and Portuguese cod fisheries on the Newfoundland banks was very similar, and traces of their exploitation can still be seen in the place names of the Newfoundland coast. The Spanish gave up fishing in that area about three centuries ago; however, they did not stop eating salted cod, and started to import it from Norway, Iceland, the Faroes, Newfoundland, and Scotland.

After World War I attempts were made to re-establish Spain's position as a cod-fishing nation, and in 1927 a fishing company was established in San Sebastian. Operating with two trawlers to start with, this company obtained very good results, and later on, after the Spanish Civil War, two other companies were established.

It is important to differentiate between the cod-fishing activities started by these three companies and that done by the "parejas." Pair trawling was started on the Newfoundland grounds in 1939, with very poor results. But when these vessels recommenced operations in 1949 they did much better, and in the 1959 season 72 "pareja" vessels were due to fish in Newfoundland waters.

By August 1960 the San Sebastian firm will own 19 trawlers--14 Diesel vessels and five oil-burning steamships. Their sizes range from the 1,190 g.r.t. (gross registered tons) of the steam vessel Euskal Erria to the 1,350 g.r.t. of the motorship Tornado, and the total tonnage owned by the company amounts to approximately 24,000 g.r.t.

This company also manages two processing plants, one in Pasejes (Spanish Basque country) covering 230,000 square feet and complete with two wharves, driers, storage rooms, general stores, etc. The other plant is in El Ferrol, and covers some 170,000 sq. ft.

The second firm owns 4 trawlers and has two more ordered from Seville shipyards. The 4 in operation are all Diesel-powered, each of 975 g.r.t. This company also owns a plant in Chapela-Vigo, similar to those of the first company.

The third firm located in Corunna owns 12 trawlers, all Diesel-powered and ranging from 1,250 to 1,363 g.r.t. The total tonnage of this fleet is about 16,200 g.r.t., and the company owns one plant in Corunna. This is the largest and most modern of the Spanish cod plants.

Of the firms operating "pareja" vessels in the cod fisheries, one firm appears to be the most important. This firm is an industrial complex with two other associated companies and manages 120 fishing vessels.

The plant operated by the industrial complex covers an area of 323,000 sq. ft.

Spain (Contd.):

with an annual production of 12,000 metric tons of dried cod. The companies in the industrial complex also have interests in wholesale, freezing, fish meal, insurance, and other fishing activities.

There are several other firms operating "pareja" vessels in North American waters. These companies sell their catches to many small plants established in Corunna, Vigo, Gijon, and Pasajes.

In general, the trawlers make two trips each year. The first is from January or February to June, and the second from July or August to November or December. The "parejas" begin their trips in March or April, and make their last trip during September or October.

Some of the "pareja" vessels return to Spain as soon as their holds are filled with salt fish, while others transfer their catches to specially chartered cargo vessels and continue to fish.

In spite of the development of her own cod-fishing fleets, Spain continues to import dried and salted cod, 14,293 metric tons being imported from January to November 1958. The total consumption in Spain is thought to be about 70,000 metric tons annually, but for some reason the Spanish liking for this food has fallen noticeably since the end of the Spanish Civil War.

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TUNA FISHERY, 1958:

Two species of tuna make up the bulk of the Spanish tuna landings. The albacore tuna (Germo alalunga) is caught by vessels based in northern and northwestern Spanish ports. The main ports for this species are: Bermeo, Vigo, Aviles, Gijon, Zumaya, La Coruna, Santona, Ondarroa, Santander, Lequeitio, and Vivero. In 1958, the landings at the four leading ports amounted to 5,700 metric tons at Bermeo, 5,000 tons at Vigo, 4,600 tons at Aviles, and 3,000 tons at Gijon. Landings at each of the other ports exceeded 1,000 tons, but were less than 2,000 tons.

Bluefin tuna (Thunnus thynnus) is landed principally at ports located in the south of Spain. The ports with the largest catches in 1958 were: Barbate, San Fernando, Tarifa, and Ceuta. The landings amounted to 4,200 tons, 2,300 tons, 1,500 tons, and 1,000 tons, respectively. (United States Consulate, Vigo, report of December 17, 1959.)

Surinam

OFFSHORE SHRIMP TRAWLING INCREASED IN 1959:

Shrimp trawling for large shrimp in Surinam's offshore waters began in October 1958. Prior to that date commercial shrimp fishing was confined largely to inshore waters for the small seabob. Offshore shrimp trawling was started with two trawlers. Four more vessels were added to the fleet in March 1959 and three more in August 1959. By 1960, the American-owned company, which has exclusive rights to Surinam shrimp exports, expects to have a fleet of 25 trawlers. Most of the trawlers are 65 feet in length and equipped with 150 hp. Diesel engines.

Landings made by the offshore shrimp vessels for the 12-months period ending October 1959 amounted to about 300,000 pounds of pink shrimp. Exports during that period were about 279,000 pounds (all to the United States except for a very small quantity to Curacao), valued at about US$210,000 at the primary receiver level in New York City. Prices to the vessels in November 1959 were 42 U. S. cents a pound for heads-off shrimp.

There are no export taxes on shrimp exports from Surinam. Although the American owned shrimp fishing and processing firm holds the exclusive right to export shrimp from Surinam, the Surinam Government retains the right to issue export licenses for shrimp, fish, and fish derivatives for up to 88,000 pounds a year, except that licenses for export of dried shrimp cannot exceed half this amount. (United States Consulate report from Paramaribo, November 18, 1959.)

U.S.S.R.

EIGHT FISHERY CENTERS TO BE ESTABLISHED IN KURILE ISLANDS:

A Moscow broadcast is reported to have announced early in December 1959 that the Soviet Union has decided to establish eight fishery centers in the Kurile Islands in 1960. The centers will be established under the seven-year fishery plan. In addition to mackerel-pike fishing bases, processing and distributing plants will be constructed. Mackerel-pike fishing by the Soviet Union has been carried out for the past 2 or 3 years in the Pacific with motherships. It is thought that setting up of shore facilities will coordinate activities of vessels, motherships, and land facilities. (Fisheries Economic News, a Japanese periodical, December 4, 1959.)

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NEW FACTORYSHIP HEADS WHALING FLEET:

On October 10, 1959, the Slava whaling fleet left the Black Sea port of Odessa for its 14th season in the Antarctic. The Slava whaling fleet now consists of the old flagship Slava and 12 new high-speed Diesel-electric whalers.

The second and new fleet set sail a few days later. This is the Soviet Ukraine fleet, a fleet of 20 whalers with the new factoryship whaler Soviet Ukraine as flagship.

This new vessel was built in less than three years at the Nosenko Shipyard, Nikolayev, on the Black Sea, and is the world's biggest ship of its kind, having a displacement of 44,000 tons--15,000 tons more than the Slava.

The Soviet Ukraine is 716 feet over-all (218 meters), has a beam of 92 feet (28 meters), and "stands as tall as a 12- to 14-story building."

It is equipped with mechanized processing lines and scientific laboratories. Its skipper said of this ship:

"The Soviet Ukraine is on a level with the very latest in shipbuilding. More than a thousand designers and some 500 factories of the Moscow, Latvian, Kiev, Leningrad, Kharkov, Khabarovsk, Rostov, and other Economic Councils took part in designing and supplying equipment for it."

The Soviet Ukraine can freeze some 100 metric tons of whale meat and livers daily, and store 1,800 tons of frozen products in its cold storage section.

There are 265 well-appointed one- and two-berth cabins for the crew. (World Fishing, December 1959.)

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NEW FLOATING FACTORYSHIP FOR CRAB AND FISH PROCESSING:

A floating crab and fish processing vessel is being built in Leningrad for future operation in the North Pacific Ocean. It is to be equipped with the most modern machinery and is the first vessel of that type to be built in the U.S.S.R.

It is a welded vessel with a gross tonnage of 14,000 tons. The length is over 524 feet, with a breadth of almost 66 feet. It will be Diesel-powered and manned by a crew of 130, plus 507 workers for the fish-processing operations.

All processing operations for crab and fish will be mechanized with new continuous cookers for crab, machines for packing crab in parchment paper, etc.

The vessel can remain at sea for two months during which time it can pack 25,000 cases of canned crab, 50,000 cases of canned fish and salmon, plus substantial amounts of canned fish roe and fish meal. The vessel also has possibilities for processing brisling and sardines. (Fiskets Gang, December 10, 1959; translation from Russian newspaper Vodnyi Transport, November 24, 1959.)

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NEW HERRING FACTORYSHIP PLANNED:

The Russian newspaper Vodnyi Transport, November 28, 1959, carries a report and a photograph of the model of the first herring factoryship to be built in the U.S.S.R.

U.S.S.R. (Contd.):

The new factoryship will be welded, with two decks, have a displacement of 15,000 tons, length of 145 meters (475.6 feet), and a breadth of 20 meters (65.6 feet). The main engine, of 6,250 hp., will give the vessel a speed of 14.5 knots.

The ship is designed for anchoring in depths up to 300 meters (164 fathoms). In addition, there will be fenders and similar equipment which will permit trawlers alongside the vessel to unload in a relatively high sea. The new herring factoryship will be completed in 1961. (Fiskets Gang, December 24, 1959.)

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NEW HERRING FISH MEAL AND OIL FACTORYSHIP:

The new floating herring oil factoryship Lamut, 4,982 gross tons, is being completed by a shipyard in Japan for Sudoimport, Moscow, according to Dansk Fiskeritidende (November 27, 1959), a Danish fishery trade periodical. The vessel is designed for a speed of 12.5 knots and a processing capacity of 120 metric tons of herring per day.

United Kingdom

BAG-NET DEVELOPED FOR TRANSFERRING CATCHES AT SEA:

The trawler Northern Sea tied up at Grimsby, England, and ended an experiment which may revolutionize fishing developments in the British industry.

The trawler had taken part in the successful transfer of fish from one trawler to another in the open seas off Bear Island. The owning company has been exploring the possibilities of transfers for some time and has considered many suggestions. They decided that the best system was for fish to be floated off in special nets.

Shaped like huge "sausages," the nets were braided with a mesh smaller than fishing-net mesh. One end was tied up like a trawl's cod end, and the "sausage" was dropped down the fish hold hatch and the other end secured open. Gutted fish was dropped into the open end and when filled, the "sausage" held about a ton of fish. It was tied up at the top and lowered over the trawler's side, secured to a buoy. Several "sausages" were strung together by lines.

As soon as the "sausages" went over the side of the Grimsby trawler Northern Wave, a radio message was sent to the Northern Sea, then about three miles away. The "sausages" were only in the sea about 20 minutes before being sighted and within an hour the Northern Sea had the fish stowed away, and was on the way home.

The experiment opens up several possibilities. Trawlers owned by the same company could fish an area while another vessel acted merely as a carrier. Trawlers just starting fishing could transfer their first few hauls to another ship about to leave for home, as with the Northern Sea, and this method would enable ships to stay at sea several days longer without deterioration in catches.

It could also point the way to trawlers fishing in packs and delivering their catch to a mothership which could quick-freeze the fish. At the same time the mothership could refuel the trawlers with oil and ice when they decided to fill up their own fish holds and go home.

The picking up of catches of trawlers about to return home is the most immediately feasible idea and it may lead to owners forming an association among themselves to allow transfers to be made between all ships of one particular port.

The captain of the Northern Sea, commenting on the scheme when he arrived home, said; "We arranged everything over the radio the previous night and I was about three miles away from the Northern Wave when the 'sausages' were released. We had no difficulty in sighting or hoisting aboard. The weather was good but I can see no great difficulty in carrying out a transfer in winter. It may be a little more difficult but I think it can be done all right."

The transferred fish was landed only six days after being caught and was in good condition. Buyers noted how clean it was, probably because it had had a second washing in the sea during the transfer.

Samples were sent to the fisheries research laboratories at Hull for expert examination (Canadian Fishermen, December 1959.)

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EARNINGS OF INSHORE VESSELS, 1958:

The British White Fish Authority carries out annual surveys of the costs and earnings of inshore fishermen. Summaries of total costs and earnings derived from the 1958 survey were included in the Authority's Annual Report for 1958/59 published in July 1959. Since then, following further analysis of the returns, more detailed information has become available.

The results of 460 vessels were included in the 1958 sample--237 in Scotland, 223 in England and Wales; the total value of fish landed by these vessels represented slightly less than one-third of the total inshore catch. The vessels were drawn from every major inshore fishing district, and from no less than 139 different ports.

The size of vessel appears to determine, in general, the size of the net surplus and the level of crews' earnings. Small vessels of under 30 feet in length, which are more common in England and Wales than in Scotland, showed an average profit of £52 (US$145.60) for the year and an average crew wage of £371 (US$1,038.80). At the other end of the scale 60-69 foot vessels showed an average profit of £1,318 (US$3,690.40), and a crew wage of £716 (US$2,004.80). The

United Kingdom (Contd.):

average net profit per stone could not be computed for all vessels as the weight of fish landed could not always be given. For vessels where the information was given the average profit per stone was 9¼d. (10.8 U. S. cents), a little less than it was in 1957.

Operating costs continued to rise in 1958, but oil, the cost of which absorbed 6.2 percent of total earnings, and marine insurance, which absorbed 3 percent, were both a little lower than in 1957. Vessels and engine repairs at 5.3 percent of total earnings and gear upkeep and repairs at 10.2 percent were among the principal items showing increases.

The kind of fishing pursued is not uniform all around the coast and the different methods used result in different degrees of profitability. The table shows the average operating results for vessels in each area. The relatively prosperous fishing area of East and North-East Scotland illustrates the success of the seine-net vessel; whereas the results shown for Eastern England reflect the port sprat seasons which have become a feature of East Coast fishing during the last year or two.

Earnings of Inshore Vessels, 1958

Country	Average Profit Per Vessel		Average Crew Wage	
	£	US$	£	US$
Scotland:				
North East	1,091	3,055	692	1,938
East	775	2,170	598	1,674
South	989	2,769	689	1,929
North West and Shetland	613	1,716	540	1,512
England & Wales:				
North East	460	1,288	628	1,758
East	94	235	389	1,089
South East	183	512	399	1,117
South West	189	529	375	1,050
Wales	135	378	429	1,201
North West	211	591	545	1,526

Subsidy forms an important part of vessel earnings and in 1958 averaged 7.7 percent of total earnings, or an average addition of over £1 (US$2.80) a week to crews' wages. Because of the greater incidence in England and Wales of fishing for shellfish, which is not subsidized, the averages for England and Wales and Scotland separately show considerable differences. (World Fishing, December 1959.)

Note: Also see Commercial Fisheries Review, January 1958 p. 101.

* * * * *

FISHERMEN TRAINING AND LOAN PROGRAM FOR NORTHWEST SCOTLAND INITIATED:

Because the British Government does not believe that the fishing grounds in The Minch are as productive as they should be, and hence do not make as big a contribution to the economy of the Western Islands as they could, the Government is attempting to revive the fishing industry in the Outer Hebrides. The Minch is the strait between Northwest Scotland and the Outer Hebrides. To encourage young Scotsmen who live in the Outer Islands to become fishermen, a new training program has been drawn up. It will provide up to six months duty on an East Coast fishing boat working in The Minch area. If a man has already completed such a period of training or has had other experience, under the terms of the program he can continue with another six months of training on a special training fishing vessel of the Scottish Home Department. It is hoped that training can start on east coast vessels in The Minch by spring 1960. In conjunction with the plan to select and train fishermen, loans will be extended to persons interested in fishing to enable them to acquire new boats.

Loans for new boats from 40-70 feet in length can be obtained from the Scottish Home Department. The loans can be made up to 60 percent of the approved cost of the boat and a grant of at least 25 percent will be available, leaving only 15 percent of the cost to be raised by the new fishermen. The Macaulay Trust and the Highland Fund are prepared to assist suitable fishermen to raise even the 15 percent of their share. One of the conditions of the loans is that if a grant or loan is made, the applicant "undertakes by means of the proposed boat to diligently and vigorously prosecute fishing as working owners." (U. S. Consulate report from Glasgow, January 6, 1960.)

* * * * *

RESTRICTIONS REMOVED ON FRESH AND FROZEN FISH IMPORTS FROM DOLLAR AREA:

Effective February 1, 1960, quantitative controls were removed by the United Kingdom on imports of fresh and frozen

United Kingdom (Contd.):

fish from the dollar area. This action opens the United Kingdom market to frozen halibut and other fresh and frozen fish from the United States.

Lifting of import restrictions on fresh and frozen fish removes the last vestige of import controls on fishery products imposed by the United Kingdom to conserve short dollar balances following the end of World War II. Limitations on canned salmon were eased in 1957 and completely lifted in 1958. Other canned fish were removed from import control on June 8, 1959. Fresh and frozen salmon were freed from control on November 9, 1959.

Imports of halibut by the United Kingdom from the United States have been restricted under the controls in effect following the end of World War II. The United States supplied up to 3 million pounds of frozen halibut to the United Kingdom in some prewar years. As a result of British efforts to conserve dollars in postwar years, imports of halibut from the United States have been completely restricted. The lifting of these limitations on trade will broaden the market for United States west coast halibut producers.

Uruguay

NEW FISH MEAL PLANT IN OPERATION: The Uruguayan Government-owned fishing company (Servicio Oceanografico y de Pesca) started operations in its new fish meal plant on January 13, 1960. The machinery for the new plant, which was donated by the United Nations, was imported from the United Kingdom, the United States Embassy in Montevideo reported on January 15, 1960.

Yugoslavia

FROZEN TUNA IMPORTS FROM JAPAN:

Yugoslavia is said to have signed contracts for Japanese exporters for annual imports of about 7,000 metric tons of tuna from Japan. This year's deliveries are scheduled for October 1959-May 1960. Yugoslavia, in the past, has been importing frozen tuna from Turkey for the winter operations of its canneries. In 1959, however, no business talks were concluded with Turkey and tuna fishing was carried out in the Black Sea on a small scale by Turkey. Yugoslavia is reported importing about 9,000 tons of tuna a year and about half is re-exported to Italy.

As part of its expansion plans for tuna fishing in summer in the Adriactic Sea, fishermen in Yugoslavia are learning long-line tuna fishing techniques from Japanese expert fishermen (Suisan Tsushin, December 18, 1959.)

Editorial Assistant--Ruth V. Keefe Illustrator--Gustaf T. Sundstrom

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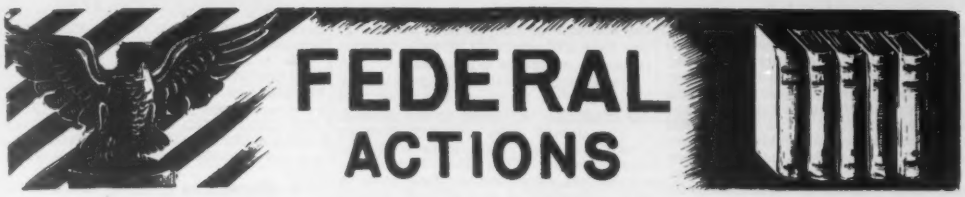


Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

POLICY ON EFFECTIVE DATE OF FOOD ADDITIVES AMENDMENT:

The food additives amendment to the Federal Food, Drug, and Cosmetic Act (72 Stat. 1785 et seq., U.S.C. 342, 348) is scheduled to become fully effective on March 6, 1960, according to a statement of policy issued by the U. S. Food and Drug Administration and published in the December 31, 1959, Federal Register. Extension of time for compliance by food and chemical manufacturers with the requirements of the Food Additives Amendment are covered.

However, the effective date may be extended on a product-by-product basis for a time not to exceed 12 months "on the basis of a finding that such extension involves no undue risk to the public health and that conditions exist which necessitate the prescribing of such an additional period."

After this amendment becomes fully effective, any food in interstate commerce may contain a food additive as defined in section 201(s) of the act only under certain prescribed conditions.

In order that decisions on requests for extension could be published before March 6, 1960, requests and supporting data were to be submitted by February 1, 1960.

Although there are many chemicals commonly used in foods which are generally recognized as safe, there are numerous others for which safe tolerances must be established by regulation. The Agency said it is not possible at this time to determine whether tolerances will be established for them before the Food Additives Amendment will become fully effective. Manufacturers, distributors, users, and food law enforcement officials needed to know the status of those additives under the amendment prior to March 6, 1960, so that they would know whether they may be employed after that date.

The Agency pointed out that all food additives had to be cleared for use before the March 6 date unless an extension was granted. Use of a food additive without a formal authorizing regulation or an extension of time after March 6, 1960, will cause the food containing it to be adulterated and illegal for shipment, the Agency added.

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

PART 121—FOOD ADDITIVES

Subpart A—Definitions and Procedural and Interpretative Regulations

STATEMENT OF POLICY WITH REFERENCE TO EFFECTIVE DATE OF FOOD ADDITIVES AMENDMENT

Under the authority vested in the Secretary of Health, Education, and Welfare by the Federal Food, Drug, and Cosmetic Act (sec. 6(c), Public Law 85-929; 72 Stat. 1789; 21 U.S.C., note under section 342 (1958 amendment)), the following statement of policy is issued:

§ 121.85 Statement of policy with reference to effective date of food additives amendment.

(a) The food additives amendment to the Federal Food, Drug, and Cosmetic Act (72 Stat. 1785 et seq., 21 U.S.C. 342, 348) is scheduled to become fully effective on March 6, 1960. However, this date may be extended on a product-by-product basis for a time not to exceed 12 months "on the basis of a finding that such extension involves no undue risk to the public health and that conditions exist which necessitate the prescribing of such an additional period."

(b) After this amendment becomes fully effective, any food in interstate commerce may contain a food additive as defined in section 201(s) of the act only if:

(1) The additive and its use, or intended use, conform to the terms of a regulation that provides for an exemption from the requirements of the food additives amendment for any food additive, and any food bearing or containing such additive because it is intended solely for investigational used by qualified experts; or

(2) There is in effect, and the additive and its use or intended use are in conformity with a regulation issued under section 409 prescribing the conditions under which such additive may be safely used.

(c) Many chemicals commonly used in foods are generally recognized as safe. A number of them have been listed in regulations in this chapter. However, there are food additives in common use that are not generally recognized as safe and for which tolerances must be established by regulation. It is not possible at this time to determine whether tolerances will be established for them before the food additives amendment will become fully effective. Manufacturers, distributors, users, and food-law enforcement officials need to know the status of these additives under the amendment prior to March 6, 1960, so that they will know whether they may be employed after that date.

(d) The Commissioner of Food and Drugs is prepared to consider requests for an extension of the effective date of the law, for specific additives. The following criteria, among others, will be used in evaluating and acting upon such requests:

(1) The effective date of the amendment can be extended for a specific additive only upon a finding, based on a study of the available facts about the additive and its toxicity, that such extension will involve no undue risks to the public health and that conditions exist that necessitate such extension.

(2) There should be evidence about the amounts of the additive present in the food and about its chronic toxicity before an extension is granted.

(3) Extensions will not be granted for a food additive if appropriate tests show the production of cancer in test animals at any dosage level, nor will they be granted if such tests show alarming symptoms other than cancer in any dosage, unless experimental data show a level of feeding to test animals that is safe to the animal and provide a satisfactory margin of safety for the levels in the human diet.

(4) Where a regulation provides for the presence of an additive in certain foods at a given level, and the other criteria of this statement of policy are met, the effective date may be extended for other similar uses of the additive.

(5) Extension should be granted only for those uses of a food additive which had been employed prior to January 1, 1958.

(6) Notice of the decisions of the Food and Drug Administration on requests for extensions will be published in the FEDERAL REGISTER.

(e) Each request for an extension should be addressed to the Commissioner of Food and Drugs, and should give:

(1) The name and chemical composition of the food additive for which extension is requested.

(2) A statement of the uses of the food additive for which extension is requested and evidence that these uses were recognized prior to January 1, 1958.

(3) Information about the physical or technical effect produced by the additive, and the quantity needed to produce such effect.

(4) Information about the quantity of the additive expected in or to be added to the food.

(5) Available information which indicates that these amounts of the additive in food will not jeopardize the public health.

(6) A statement of the reason(s) why a tolerance has not previously been requested.

(7) In order that decisions on requests for extensions may be published before March 6, 1960, requests and supporting data should be received by February 1, 1960.

(Sec. 701(a), 52 Stat. 1055; 21 U.S.C. 352(a). Interprets or applies secs. 402, 409, 72 Stat. 1785, 1789; note under 21 U.S.C. 342; 21 U.S.C. 348)

Dated: December 23, 1959.

[SEAL] GEO. P. LARRICK,
Commissioner of Food and Drugs.

* * * * *

PROPOSED SUPPLEMENTAL LIST OF FOOD ADDITIVES GENERALLY RECOGNIZED AS SAFE:

A list of food additives or substances generally recognized as safe appeared in an order issued by the U. S. Food and Drug Administration and published in the Federal Register of November 20, 1959. The order became effective on December 20, 1959, under the provisions of the Federal Food, Drug, and Cosmetic Act.

In the February 2, 1960, Federal Register the Agency published a supplemental list of food additives which it proposes to include in the regulation and asked for comments prior to inclusion of the supplemental list in the regulation.

Included in the supplemental list are chemical preservatives, buffers and neutralizing agents, nonnutritive sweeteners, nutrients, stabilizers, anticaking agents, and a group of miscellaneous additives. The supplemental list includes about 52 substances, and for some substances limits are designated.

Also in the February 2 Federal Register, the Agency also amended the food additives regulations by adding a list of substances employed in the manufacture of food-packaging materials for which prior sanctions have been granted. Included in that list are certain antioxidants, antimycotics, driers, drying oils, plasticizers, release agents, stabilizers, and a few others--about 82 substances.

* * * * *

LIST ISSUED OF SPICES, SEASONINGS, ETC., RECOGNIZED AS SAFE:

A list of spices, seasonings, essential oils, oleoresins, and natural extractives that are generally recognized as safe for intended use, within the meaning of section 409 of the Federal Food, Drug, and Cosmetic Act, was published by the U. S. Food and Drug Administration in the January 19, 1960, Federal Register. The order became effective upon publication.

The common name and the botanical name of plant source is given in the list. Included are about 70 spices and other natural seasonings and flavorings (leaves, roots, barks, berries, etc., including pepper, parsley, paprika, etc.); 128 essential oils, oleoresins, and natural extractives, including distillates; and 3 miscellaneous additives.

Treasury Department

COAST GUARD

STANDARDS FOR NUMBERING OF UNDOCUMENTED VESSELS ISSUED:

Certain regulations pertaining to the numbering of undocumented vessels have been issued by the U. S. Coast Guard and published in the December 29, 1959, issue of the Federal Register. They became effective on March 15, 1960. The purpose is to publish procedures with respect to numbering of undocumented vessels under the Federal Boat Act of 1958; to provide for temporary exemptions from numbering requirements in order to allow states which have under active consideration or have nearly perfected their numbering systems additional time in which to obtain approval; and to reduce the fee for an original number from $5.00 to $3.00, which is based on the cost for administration of the Coast Guard numbering system.

The Federal Boat Act of 1958 included provisions for establishment of a new system of numbering small undocumented vessels propelled by machinery of 10 or more horsepower, using the navigable waters of the United States. The Act permits the several states to have concurrent jurisdiction with the Federal Government over the navigable waters within their respective boundaries and to enforce their respective laws on all the waters within such boundaries whether they be intrastate waters or navigable waters of the United States. The states can assume the responsibility for numbering undocumented vessels and for the passage and enforcement of laws regarding small boats. If a state does not assume responsibility, U. S. Coast Guard regulations will apply in that state.

The new Coast Guard regulation designated 46 CFR 171.01-6 is to provide a temporary exemption until July 1, 1960, for all undocumented vessels principally used within a particular state in which it is found that such state's system for numbering is under active consideration or nearly perfected for approval and may be approved by July 1, 1960. This temporary exemption may be permitted so that the assumption of functions with respect to numbering by a particular state may be accomplished in an equitable manner.

The new regulation (designated 46 CFR 171.10-2) describes the procedures for making application for a Coast Guard number on and after April 1, 1960. Arrangements have been made with the Post Office so that applications (Forms CG-3876 and CG-3876A) will be available at all First Class and Second Class Post Offices throughout the United States and at designated Third and Fourth Class Post Offices in those states in which the undocumented vessels must be numbered by the Coast Guard. No applications will be accepted before April 1, 1960.

The amendment to 46 CFR 171.10-25 revises the procedures for obtaining a duplicate certificate of number in event the original certificate of number is lost or destroyed. Arrangements have been made with the Post Office so that applications for duplicate certificates of number (Form CG-3919) will be available at all First and Second Class Post Offices throughout the United States and at designated Third and Fourth Class Post Offices in those states in which vessels must be numbered by the Coast Guard. No applications will be accepted before April 1, 1960. No application will be processed without a special fee stamp attached thereto and postmarked.

Thirty states have enacted legislation to set up their own registering and numbering systems but all have not yet been formally approved by the Coast Guard. Additional states probably will act but the Coast Guard will take over the responsibility in those which do not conform on April 1, 1960.

* * * * *

COURT OF CUSTOMS AND PATENT APPEALS

CONSTITUTIONALITY OF TRADE AGREEMENTS ACT UPHELD:

The U. S. Court of Customs and Patent Appeals on December 16, 1959, issued a ruling upholding dismissal of the suit by a West Coast tuna canning firm, which sought to have the Trade Agreements Act declared unconstitutional.

The five-judge court unanimously upheld the decision of the U. S. Customs Court, which had dismissed the firm's suit.

The tuna canning firm had asked that tariff reductions negotiated with other countries under the Act be declared null and void because the Act amounted to an unconstitutional delegation of legislative powers by the Congress to the President, and because the tariff-cutting agreement actually was a treaty with a foreign nation which should have been ratified by the Senate.

The Court, in an opinion by Judge I. Jack Martin, rejected both arguments. It cited Supreme Court decisions which it said approved Congressional delegation powers which are limited and which indicate the intent of Congress.

The Court held that in the 1934 Act "the Congressional policy is pronounced very clearly. The stated objectives are to expand foreign markets for the products of the United States. . . ."

The Court said: "These objectives are in their nature no different than those" of the Tariff Acts of 1890 and 1922 which the high court has upheld.

Decisions of the Customs and Patent Court can be appealed to the Supreme Court.

Eighty-Sixth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other chamber actions by the House and Senate, as well as signature into law or other final disposition are covered.

AMERICAN SAMOA PROBLEMS: Senator Bartlett introduced into the Congressional Record of January 13, 1960, an article written by Senator Long of Hawaii on problems in American Samoa. The article mentions that assistance is needed in developing a more adequate economy in American Samoa. Enlargement is needed of the present fish cannery which employs 450 people. One of the greatest needs is for financial assistance in providing fishing vessels capable of competing with vessels used by other fishermen in American Samoa waters. The article further states that the Bureau of Commercial Fisheries should provide assistance in a future aid program to American Samoa.

COLOR ADDITIVES IN FOODS: The House Committee on Interstate and Foreign Commerce held hearings February 10 and 11 on H. R. 7624 (Harris) and S. 2197 (Hill & Goldwater), color additive amendments to the Food and Drug Act.

FISHERIES ASSISTANCE ACT OF 1959: House disagreed to certain Senate amendments to H. R. 5421 (MacDonald)--passed House August 26, 1959, and passed and amended in Senate September 11, 1959--to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes. Conference on the bill was requested with the Senate and House and Senate conferees were appointed.

IMPORTED COMMODITY LABELING: The House on February 2, 1960, passed by a voice vote H. R. 5054 (Herlong), a bill to amend the Tariff Act of 1930 with respect to the marking of imported articles and containers, as amended. Provides that imported articles removed from original container, repacked, and offered for sale in a new package or container, shall be marked to show the country of origin. Bill referred to the Senate, where no companion bill has been introduced to date.

INCOME TAX LAW REVISION IN FAVOR OF FISHERMEN: H. R. 10305 (Wilson), a bill to extend to fishermen the same treatment afforded farmers in relation to estimated income tax; to the Committee on Ways and Means; introduced in House February 9, 1960. Similar to H. R. 604 (Pelly), H. R. 1925 (King of Calif.), and S. 774 (Magnuson); all introduced during first session of the 86th Congress.

INTERIOR APPROPRIATIONS: H. R. 10401 (Kirwan), a bill making appropriations for the Department of Interior and related agencies for the fiscal year ending June 30, 1961, and for other purposes; filed on February 12, 1960 (H. Rept. 1264). The House passed the bill by a voice vote on February 16, 1960. Included in the bill is an increase of $4,090,800 for the Fish and Wildlife Service, primarily to replace permanent appropriations from receipts, including duck stamps, which will no longer be available for operations, enforcement, or research.

Department of the Interior and Related Agencies Appropriations for 1961, Part I (Hearings January 12, 13, 14, 26, 27, and 28, 1960, before a Subcommittee of the Committee on Appropriations, House of Representatives, 86th Congress, 2nd Session, on

appropriations for the Department of Interior except Bonneville Power Administration, Bureau of Reclamation, Southeastern Power Administration, and Southwestern Power Administration), 1027 pp., printed. Includes hearings on operations of the Fish and Wildlife Service and also specifically the Bureau of Commercial Fisheries.

Department of the Interior and Related Agencies Appropriations for 1961, Part II (Hearings January 21, 22, and 25, 1960, before a Subcommittee of the Committee on Appropriations, House of Representatives, 86th Congress, 2nd Session, on appropriations for several related agencies of the Department of the Interior, including the Outdoor Recreation Resources Review Commission, Smithsonian Institution, and Transitional Grants to Alaska), 517 pp., printed.

LAW OF THE SEA: Public hearings were held by the Senate Committee on Foreign Relations on January 20, 1960, at 10:30 a.m. in the New Senate Office Building, Washington, D. C., on four conventions and an optional protocol on the Law of the Sea: Executive J, "A Convention on the Territorial Sea and Contiguous Zone;" Executive K, "A Convention on the High Seas;" Executive L, "A Convention on Fishing and Conservation of the Living Resources of the High Seas;" Executive M, "A Convention on the Continental Shelf;" Executive N, "An Optional Protocol of Signature Concerning the Compulsory Settlement of Disputes."

FISH AND WILDLIFE: Miscellaneous Fish and Wildlife Legislation (Hearings May 5, June 3, 30, July 1, and August 4, 1959, before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, United States House of Representatives, 86th Congress, 1st Session, on H. R. 350, H. R. 1984, H. R. 2398, H. R. 2565, H. R. 3087, H. R. 4019, H. R. 4402, H. R. 5004, H. R. 5119, H. R. 5271, H. R. 5813, H. R. 5814, H. R. 5954, H. R. 7045, and H. R. 7455), 301 pp., printed. Contains purpose and provisions of each bill, and statements, reports, and recommendations of representatives of Government and industry. Also includes individual views and comments on bills, and various statistical tables.

Of special interest to commercial fisheries are the hearings on H. R. 4402, a bill to provide for the construction of a salt-water research laboratory at Seattle, Wash.; H. R. 350, a bill to provide for the construction of a fish and wildlife marine laboratory and experiment station in the central Gulf coast area of Florida; H. R. 5954, a bill to clarify a provision in the Black Bass Act relating to the interstate transportation of fish and for other purposes; and H. R. 1984, H. R. 3087, H. R. 4019, H. R. 5119, and H. R. 5271, all providing for the eradication of starfish in Long Island Sound and adjacent waters.

OCEANOGRAPHIC SURVEYS: H. R. 10412 (G. P. Miller), a bill to establish a public policy with respect to oceanographic surveys, and to provide for coordination of the efforts of Federal agencies with respect to oceanographic surveys; to the Committee on Merchant Marine and Fisheries; introduced in House February 15, 1960.

SHRIMP CONSERVATION CONVENTION WITH CUBA: H. R. 9917 (Bonner), a bill to give effect to the Convention between the United States and Cuba for the conservation of shrimp, signed at Havana, August 15, 1958; to the Committee on Merchant Marine and Fisheries; introduced in House January 26, 1960.

Identical to S. 2867 (Magnuson), referred to the Committee on Interstate and Foreign Commerce; introduced in Senate January 20, 1960.

SHRIMP IMPORTS: H. Res. 442 (Boggs), a resolution directing the Tariff Commission to make an investigation of the effect of the existing customs treatment of shrimp upon the domestic shrimp industry; to the Committee on Ways and Means; introduced in House February 8, 1960.

The House Committee on Ways and Means announced on February 9 its approval of a Committee resolution directing the Tariff Commission to make an investigation of the effect of the existing customs treatment of shrimp upon the domestic shrimp industry. The Committee resolution is identical to H. Res. 442.

TARIFF NEGOTIATIONS: H. Con. Res. 503 (Thomson), concurrent resolution expressing the sense of Congress that the United States should not grant further tariff reductions in the forthcoming tariff negotiations under the provisions of the Trade Agreements Extension Act of 1958, and for other purposes; to the Committee on Ways and Means; introduced in House January 25, 1960. Identical to H. Con. Res. 512 (Bailey), H. Con. Res. 513 (Berry), H. Con. Res. 515 (Dent), H. Con. Res. 516 (Dorn of S. C.), H. Con. Res. 517 (Fisher), H. Con. Res. 518 (Gross), H. Con. Res. 519 (Hemphill), H. Con. Res. 520 (McIntire), H. Con. Res. 521 (Mason), H. Con. Res. 522 (Oliver), H. Con. Res. 523 (Smith of Kan.), H. Con. Res. 524 (Stratton), and H. Con. Res. 525 (Utt); all introduced in House January 26, 1960. Also identical to H. Con. Res. 527 (Mack of Wash.), introduced January 27; H. Con. Res. 554 (Saylor), introduced February 1; H. Con. Res. 560 (Tollefson), introduced February 2; H. Con. Res. 580, introduced February 4; and H. Con. Res. 583 (Hays), introduced in House February 8, 1960.

TRANSPORATION: S. 3048 (Magnuson), a bill to amend the Interstate Commerce Act with respect to reasonable differentials in favor of joint rates for through transportation by rail and water, and for other purposes; to the Committee on Interstate and Foreign Commerce; introduced in Senate February 16, 1960.

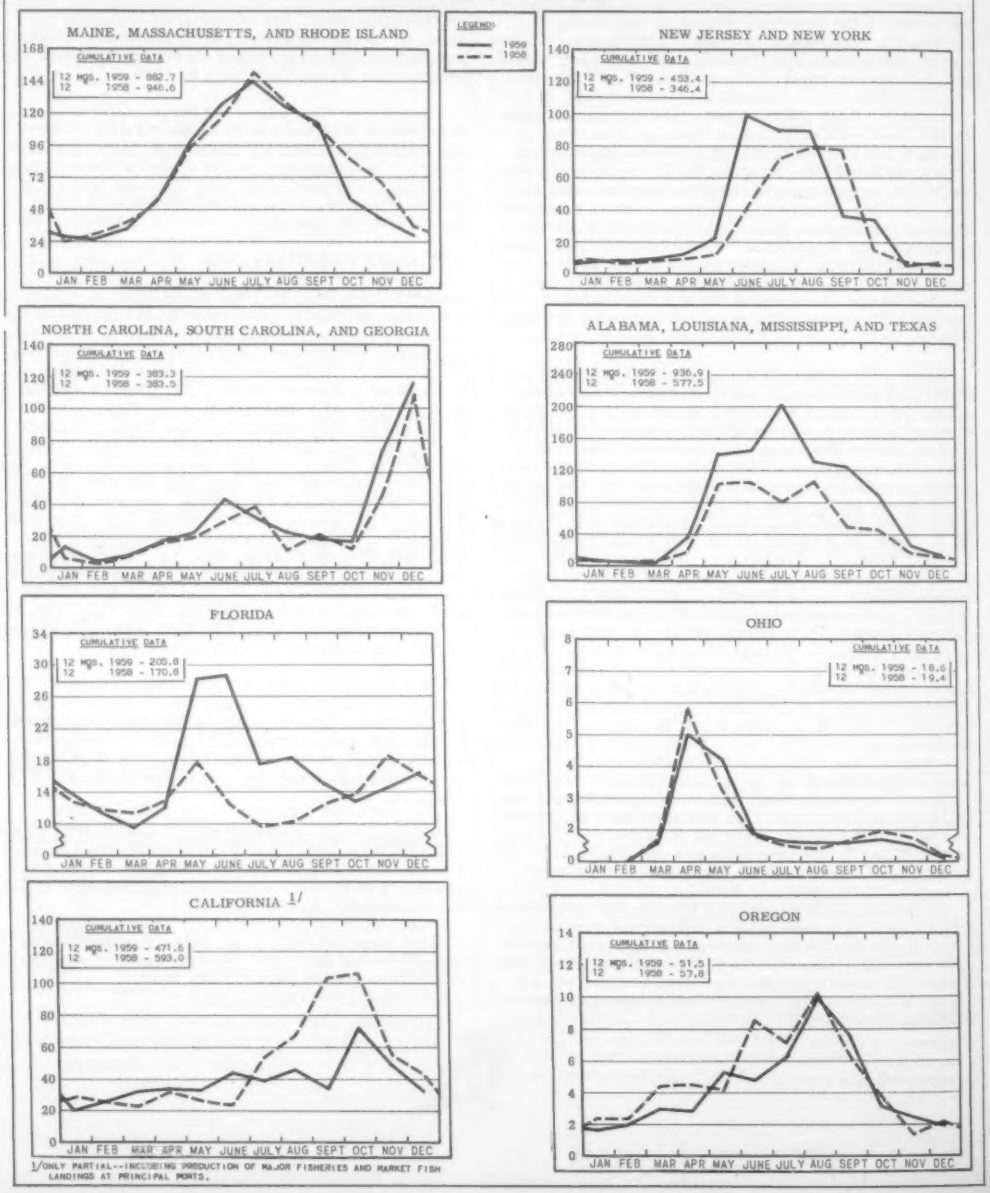
VESSELS ADMEASUREMENT SIMPLIFICATION: S. 2916 (Magnuson), a bill to simplify the admeasurement of small vessels; to the Committee on Interstate and Foreign Commerce; introduced in Senate January 26, 1960.

Also identical bill H. R. 9916 (Bonner); to the Committee on Merchant Marine and Fisheries; introduced in House January 26, 1960.

FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

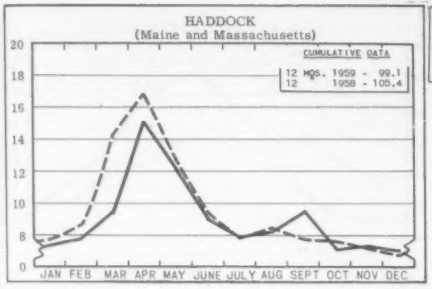
In Millions of Pounds



1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds


HADDOCK
(Maine and Massachusetts)
CUMULATIVE DATA
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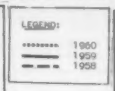
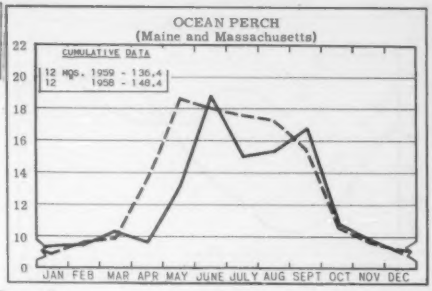
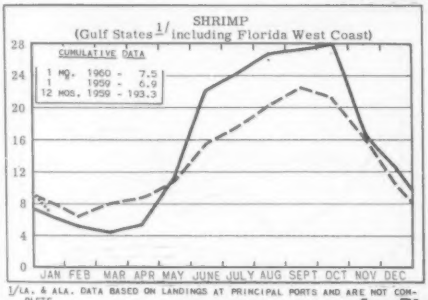
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

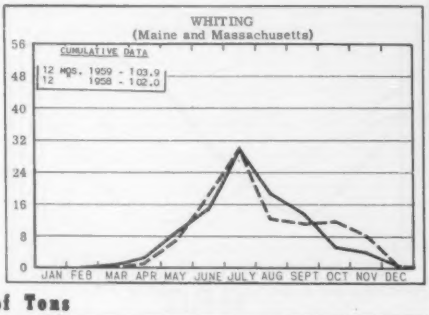



OCEAN PERCH
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1959 - 136.4
12 1958 - 148.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

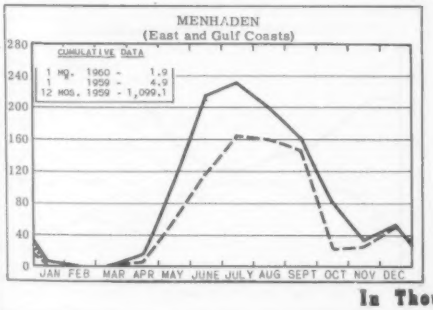
In Millions of Pounds

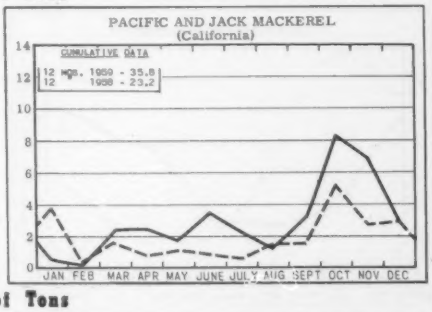

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
1 MO. 1960 - 7.5
1 1959 - 6.9
12 MOS. 1959 - 193.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

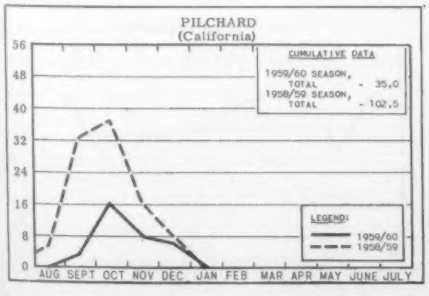

WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1959 - 103.9
12 1958 - 102.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
1 MO. 1960 - 1.9
1 1959 - 4.9
12 MOS. 1959 - 1,099.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
12 MOS. 1959 - 35.8
12 1958 - 23.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons



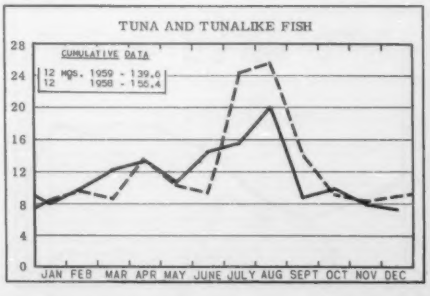
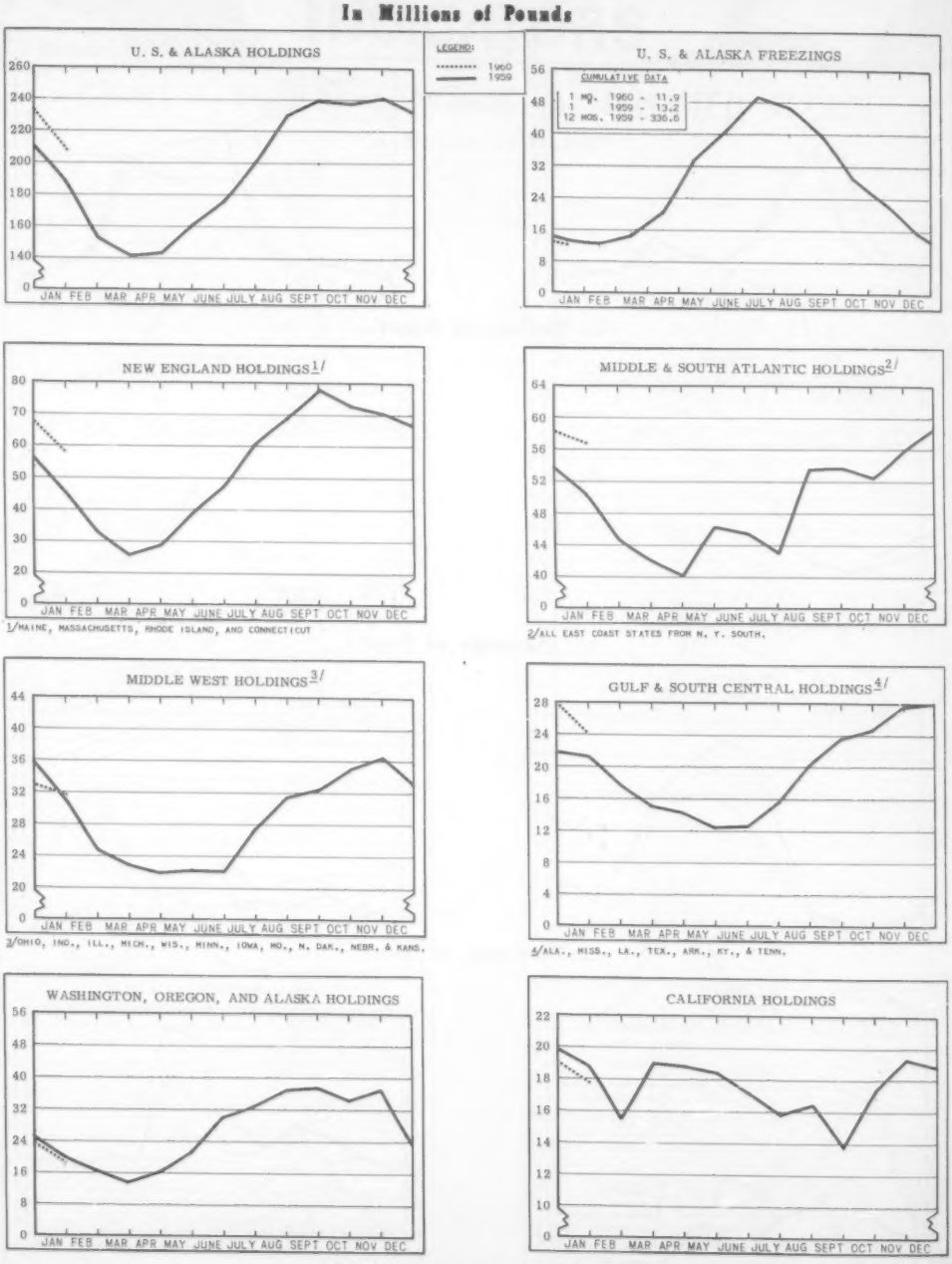


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. & ALASKA HOLDINGS
LEGEND:
1960
1959
U. S. & ALASKA FREEZINGS
CUMULATIVE DATA
1 MO. 1960 - 11.9
1 MO. 1959 - 13.2
12 MOS. 1959 - 336.6
NEW ENGLAND HOLDINGS 1/
MIDDLE & SOUTH ATLANTIC HOLDINGS 2/
MIDDLE WEST HOLDINGS 3/
GULF & SOUTH CENTRAL HOLDINGS 4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT

2/ALL EAST COAST STATES FROM N. Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

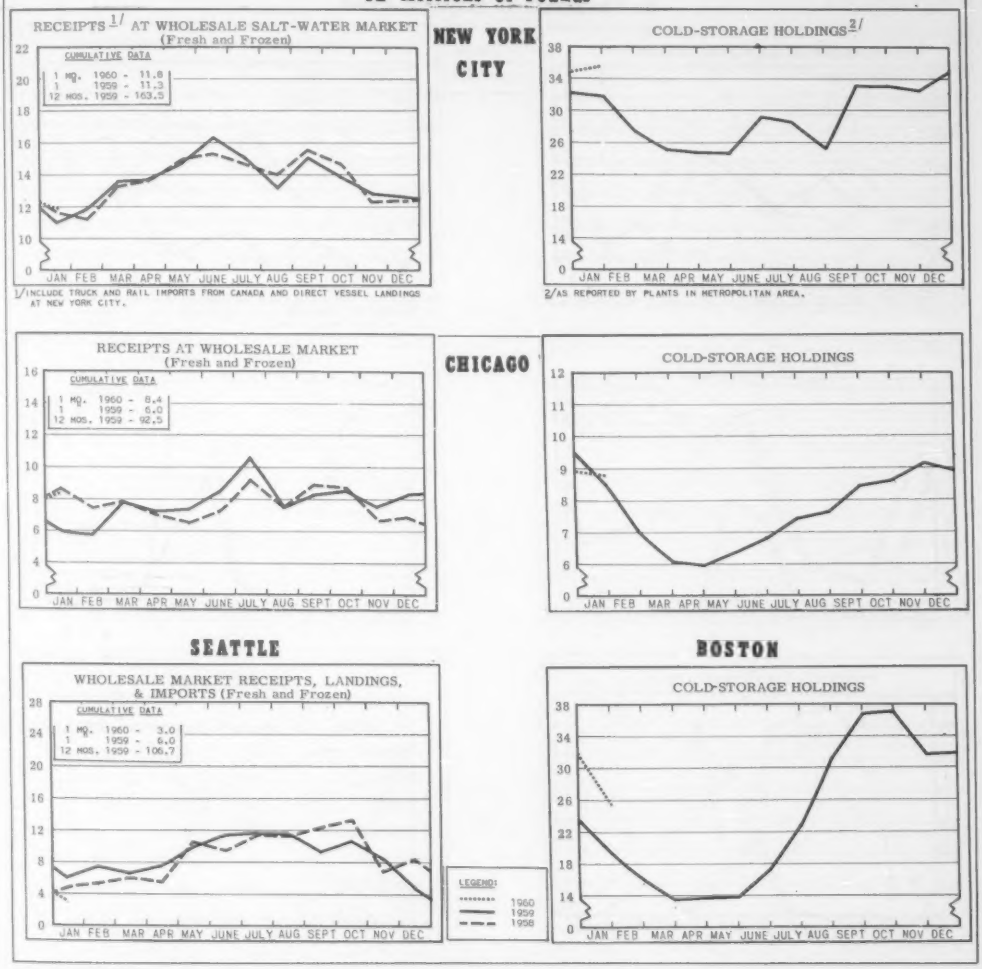

RECEIPTS 1/ AT WHOLESALE SALT-WATER MARKET (Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1960 - 11.8
1 1959 - 11.3
12 MOS. 1959 - 163.5
NEW YORK CITY
COLD-STORAGE HOLDINGS 2/
1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.
RECEIPTS AT WHOLESALE MARKET (Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1960 - 8.4
1 1959 - 6.0
12 MOS. 1959 - 92.5
CHICAGO
COLD-STORAGE HOLDINGS
SEATTLE
WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (Fresh and Frozen)
CUMULATIVE DATA
1 MO. 1960 - 3.0
1 1959 - 6.0
12 MOS. 1959 - 106.7
BOSTON
COLD-STORAGE HOLDINGS
LEGEND:
1960
1959
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

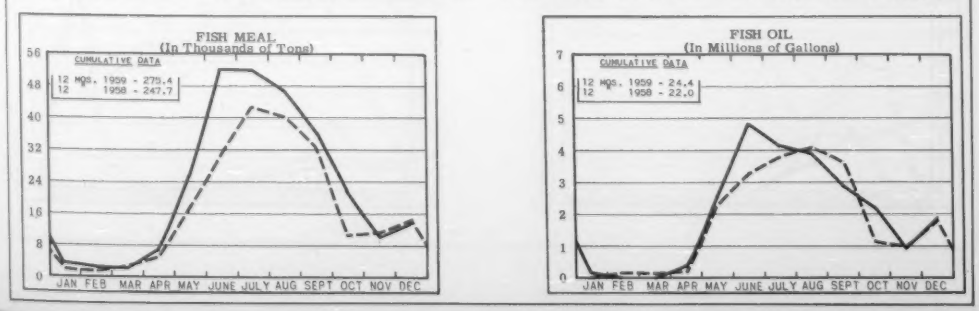
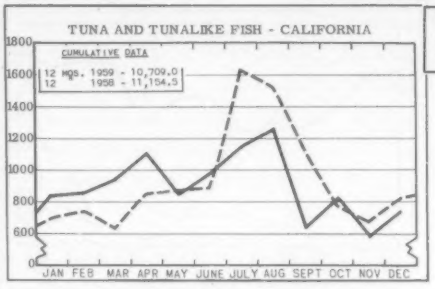
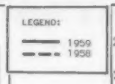
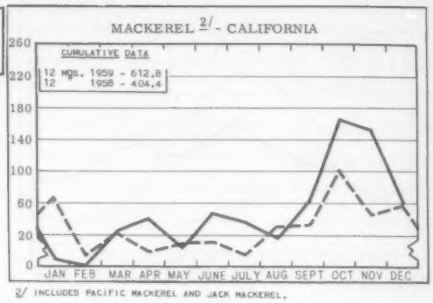

FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
12 MOS. 1959 - 275.4
12 1958 - 247.7
FISH OIL
(In Millions of Gallons)
CUMULATIVE DATA
12 MOS. 1959 - 24.4
12 1958 - 22.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

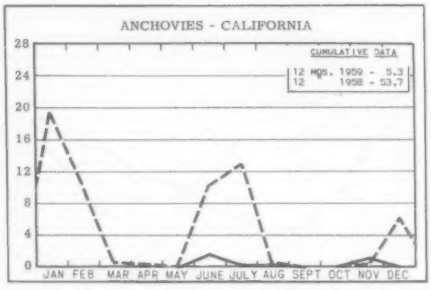
In Thousands of Standard Cases

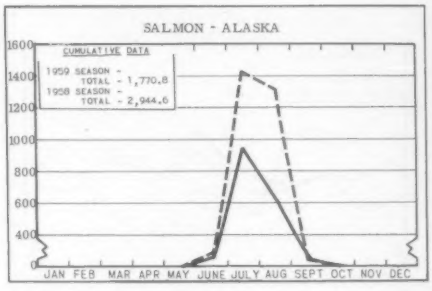

TUNA AND TUNALIKE FISH - CALIFORNIA
CUMULATIVE DATA
12 MOS. 1959 - 10,709.0
12 1958 - 11,154.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

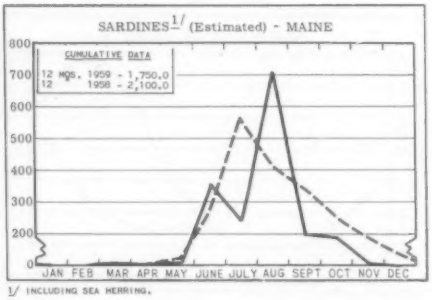




2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



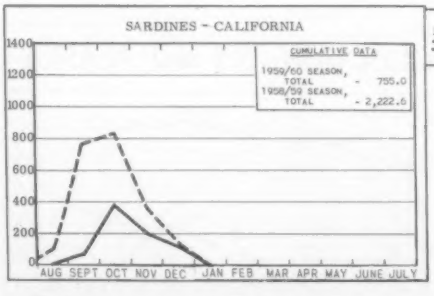

SALMON - ALASKA
CUMULATIVE DATA
1959 SEASON - TOTAL - 1,770.8
1958 SEASON - TOTAL - 2,944.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


SARDINES 1/ (Estimated) - MAINE
CUMULATIVE DATA
12 MOS. 1959 - 1,750.0
12 1958 - 2,100.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.


SARDINES - CALIFORNIA
CUMULATIVE DATA
1959/60 SEASON, TOTAL - 755.0
1958/59 SEASON, TOTAL - 2,222.6
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

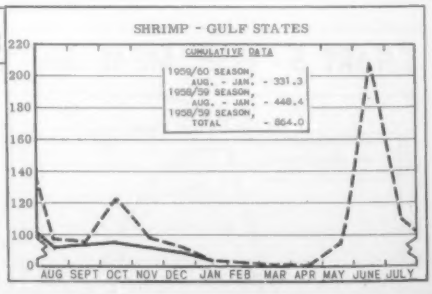
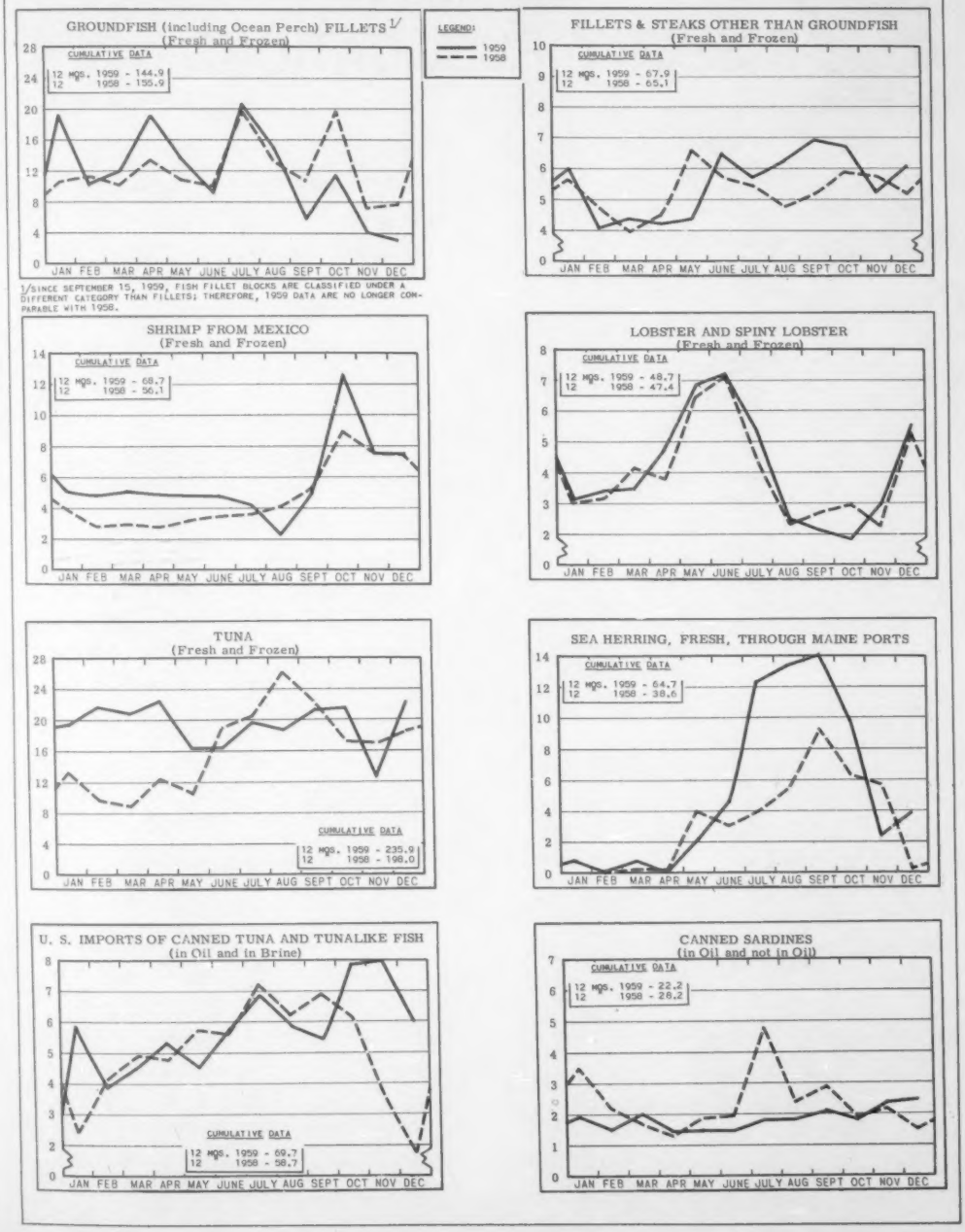
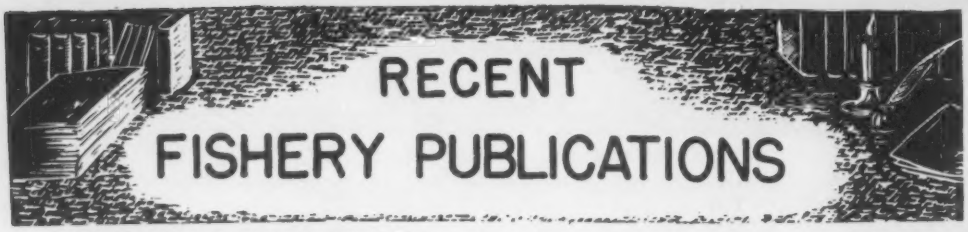

SHRIMP - GULF STATES
CUMULATIVE DATA
1959/60 SEASON, AUG. - JAN. - 331.3
1958/59 SEASON, AUG. - JAN. - 448.4
1958/59 SEASON, TOTAL - 864.0
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



1/ SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1958.



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
FL - FISHERY LEAFLETS.
SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR, - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-2155 - Mississippi Landings, August 1959, 2 pp.
CFS-2171 - Fish Meal and Oil, October 1959, 2 pp.
CFS-2174 - Massachusetts Landings, September 1959, 5 pp.
CFS-2176 - Mississippi Landings, September 1959, 2 pp.
CFS-2182 - Alabama Landings, September 1959, 2 pp.
CFS-2183 - Georgia Landings, October 1959, 2 pp.
CFS-2186 - Florida Landings, October 1959, 6 pp.
CFS-2188 - Maine Landings, October 1959, 3 pp.
CFS-2189 - New York Landings, October 1959, 4 pp.
CFS-2190 - Texas Landings, October 1959, 3 pp.
CFS-2198 - North Carolina Landings, November 1959, 4 pp.
CFS-2200 - Ohio Landings, October 1959, 2 pp.
CFS-2201 - New Jersey Landings, November 1959, 3 pp.
CFS-2205 - Pacific Coast States Fisheries, 1958 Annual Summary, 6 pp.
CFS-2206 - South Carolina Landings, November 1959, 2 pp.
CFS-2207 - Georgia Landings, November 1959, 2 pp.
CFS-2209 - Frozen Fish Report, November 1959, 8 pp.
CFS-2210 - Fisheries of the United States and Alaska, 1958 Annual Summary, 15 pp.
CFS-2211 - Rhode Island Landings, October 1959, 3 pp.
CFS-2216 - Florida Landings, November 1959, 6 pp.
CFS-2218 - Ohio Landings, November 1959, 2 pp.
CFS-2219 - Rhode Island Landings, November 1959, 3 pp.

FL-471 - Edible Crabs, by Charles H. Walburg, 4 pp., illus., 1959 (Revision of FL-71, July 1945).

FL-487 - Spiny Lobster Gear and Fishing Methods, by C. E. Cope, 20 pp., illus., June 1959. Describes the spiny lobster fishery in the Florida area. Includes details of boats and deck fittings used, current gear and methods, former gear and methods, and approximate costs of spiny lobster gear (1959). Some excellent drawings accompany the text.

SL-107 - Firms Canning Fish and Shellfish Specialties, 1958 (Revised), 5 pp.

SL-162 - Firms Producing Fish Sticks and Portions, 1959 (Revised), 2 pp.

SSR-Fish. No. 289 - Counts of Red Tide Organisms, Gymnodinium breve, and Associated Oceanographic Data from Florida West Coast, 1954-57, by John H. Finucane and Alexander Gradovich, 224 pp., illus., March 1959.

SSR-Fish. No. 297 - Lake Superior Limnological Data, 1951-57, by Alfred M. Beeton, James H. Johnson, and Stanford H. Smith, 183 pp., illus., April 1959.

SSR-Fish. No. 305 - Stream Catalog of Eastern Section of Ketchikan Management District of Southeastern Alaska, by John Wilson Martin, 398 pp., illus., April 1959. Stream descriptions, maps, historical records, and salmon escapement data are compiled for 117 salmon streams in the eastern section of the Ketchikan fishery management district. Each stream is located geographically by latitude and longitude, and by orientation to prominent land masses. The species of salmon utilizing the spawning grounds and estimates of the escapement magnitude each year for many years are given.

SSR-Fish. No. 306 - Reclamation of Indian and Abrams Creeks in Great Smoky Mountains National Park, by Robert E. Lennon and Phillip S. Parker, 26 pp., illus., May 1959.

SSR-Fish. No. 311 - Bristol Bay Oceanography, August-September 1938, by Felix Favorite and Glenn Pedersen, 35 pp., illus., August 1959.

SSR-Fish. No. 316 - Lethal Doses of Several Commercial Chemicals for Fingerling Channel Catfish, by Howard P. Clemens and Kermit E. Sneed, 11 pp., September 1959.

SSR-Fish. No. 317 - Age Size Composition of the Menhaden Catch Along the Atlantic Coast of the United States, 1952-55 (with a Brief Review of the Commercial Fishery), by Fred C. June and John W. Reintjes, 70 pp., illus., August 1959. Includes a brief description of menhaden purse-seine fishing gear, methods, and seasons; a summary of the major features of the 1955 Atlantic Coast purse-seine fishery; a description and analysis of the methods of sampling the catches; and tabular data resulting from the catch-sampling program.

SSR-Fish. No. 319 - Effect of Field Polarity in Guiding Salmon Fingerlings by Electricity, by H. William Newman, 18 pp., illus., September 1959.

Sep. No. 578 - The Pound-Net Fishery in Virginia: Part 2 - Species Composition of Landings Reported as Menhaden.

Sep. No. 579 - Possibilities for Applying Fish Oil to Ore Flotation.

Sep. No. 580 - Research in Service Laboratories (February 1960): Contains these articles--"Composition of Fish and Shellfish;" "Control of Drip in Chilled and Frozen Fishery Products;" "Fish Flour Research;" "Low Storage Temperatures Help Maintain Fillet Quality;" "Proposed Standards for Grades of Frozen Raw Headless Shrimp under Review;" and "Purified Fish-Oil Fractions to be made Available for Research."

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES U. S FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number Title
MNL-4 - Newfoundland's Fishing Industry, 20 pp.
MNL-5 - Danish Fisheries, 1959, 12 pp.
MNL-6 - Mexico's Fish and Shellfish Canning Industry, 1958, 23 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION BUT ARE AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Attempts at Estimating the Abundance of Fish Population from the Data of Tuna Long-Line Fishery. I--A Few Considerations on the Variations in Distribution of Catch per 1,000 Hooks, by Akira Suda, English translation, 15 pp., processed. (Translated from Report of Nankai Regional Fisheries Research Laboratory, no. 7, 1958, pp. 105-126.)

Comparison Between Survey Map by 14.5 Kc. Fish-Finder and That by 200 Kc. Fish-Finder with Sharp Beam on Same Area, by Tomiju Hashimoto and Yoshinobu Maniwa, English translation, 5 pp., processed. (Translated from Technical Report of Fishing Boat, no. 12, October 1958, pp. 149-155.)

The Daily Vertical Migration of Pelagic Fish, by S. G. Zusser, English translation, 32 pp., processed. (Translated from Behavior of Fish and Commercial Exploration, V.N.I.R.O., Trudy v. 36, pp. 83-105.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

California Fishery Products Monthly Summary, November 1959; 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish, mackerel, anchovies, and sardines; pack of canned tuna, mackerel, anchovies, and sardines; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, November and December, 1959, 6 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and imports at Port Isabel and Brownsville, Tex.; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, December 1959, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, November 1959, 24 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for October 1959, 23 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, November and December 1959, 8 and 9 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.), wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the months indicated.

Federal Administration of the Fishery Industries of Alaska, by C. Howard Baltzo, 11 pp., November 1959. (U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Box 2481, Juneau, Alaska.) A term-end report on Alaska's commercial fisheries and the accomplishments of the U. S. Bureau of Commercial Fisheries in their development. Covers the historical background of the Alaska fisheries; the development of the salmon, halibut, sablefish, herring, clam, shrimp, and crab industries; and latent fisheries such as bottomfish, cod, oysters, and whaling. Discusses the historical role of Government administration in the Alaska fisheries and functions such as fishery research, river basin studies, technology, exploratory fishing, and vessel loans. Since Alaska has now achieved Statehood, the responsibility for control and regulation of the fishery conservation program was assumed by the Alaska Department of Fish and Game at Juneau on January 1, 1960.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Changes in Tuna Landings of the Hawaiian Long-line Fishery, 1948-1956, by Richard S. Shomura, Fishery Bulletin 160 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 87-106, illus., printed, 20 cents, 1959. This study was undertaken to determine the cause of a change in species dominance in the catch of the Hawaiian long-line fishery from yellowfin to big-eyed tuna during the period 1948-49. The available commercial catch records showed that the reversal in species resulted from a shift by the larger vessels of the fleet from fishing grounds in the leeward waters of the northern islands to grounds located in the windward waters of the southern islands.

Contributions of Hudson and Connecticut Rivers to New York-New Jersey Shad Catch of 1956, by Kenneth J. Fischler, Fishery Bulletin 163 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 161-174, illus., printed, 20 cents, 1959.

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MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

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Notes on Algae of Quebec, by Lewis H. Flint, Bulletin No. 19, printed. Service de Biogeographie, University of Montreal, Montreal, Canada.

AMINO ACIDS:

"The Free Amino-Acids of Fish. II--Fresh Skeletal Muscle from Lemon Sole (Pleuronectes microcephalus)," by N. R. Jones, article, Journal of the Science of Food and Agriculture, vol. 10, May 1959, pp. 282-286, printed. The Society of Chemical Industry, 14 Belgrave Square, London S. W. 1, England.

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Animal Feed from Herring Waste, by Friedrich Jahn, East German Patent No. 11,819, June 23, 1958. Patent Office, German Democratic Republic, East Berlin, Germany.

ANTIBIOTICS:

"K Metodike Prigotovleniia Biomitsinovogo L'da" (Method of Preparing Biomycin Ice), by E. A. Smotriaeva, article, Rybnoe Khoziaistvo, no. 3, March 1958, pp. 53-56, printed in Russian. Rybnoe Khoziaistvo, Four Continent Book Corporation, 822 Broadway, New York 3, N. Y. To obtain uniform distribution of antibiotics in ice, tests have been conducted with biomycin (similar to aureomycin) prepared in U.S.S.R. Antibiotic ice can be prepared in blocks and flakes. Flake ice is more convenient to use, for in quick freezing of a thin layer of water the antibiotic is more uniformly distributed. In unequal distribution of the antibiotic, small doses of it, found in individual sections of the block, stimulate the action of microflora instead of suppressing

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it. In this work, agaroid was used to aid uniform distribution of biomycin.

"A New Fluorometric Determination of Chlortetracycline in Ice, by Tetuo Tomiyama and Yasuo Yone, article, Food Technology, vol. 13, July 1959, pp. 370-373, printed. Food Technology, The Garrard Press, 510 North Hickory, Champaign, Ill.

"Opyt Primeneniia Biomitsina Dlia Sokhraneniia Svezhei Ryby" (Test on the Application of Biomycin for Preserving Fresh Fish), by E. A. Smotriaeva and others, article, Rybnoe Khoziaistvo, no. 12, December 1958, pp. 49-51, printed in Russian. Rybnoe Khoziaistvo, Four Continent Book Corporation, 822 Broadway, New York 3, N. Y. During 1956-1957 tests were carried out on the application of biomycin in preserving fresh sprats and cod. Sprats were immersed in an aqueous solution of biomycin, 50 mg./liter concentration and preliminary-cooled to 0° C. The fish was removed from the bath after 5 minutes and covered with crushed biomycin ice. A second group of fish, cooled in ice water and overspread with ordinary ice, served as control. After ice melted, the fish was kept at +5° C. Microbiological analysis, after 8-day storage, showed that titration in culture of test fish was a million times less than in control fish. Also, that nitrogen content of volatiles in the test fish was half of that in the controlled.

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"Effect of Unsaturated Acids and Fish Oils on Plasma and Tissue Lipides from Hypercholesteremic Rats," by James J. Peifer and W. O. Lundberg, article, Federation Proceedings, vol. 18, part I, March 1959, p. 300, printed. Federation of American Societies for Experimental Biology, 9650 Wisconsin Ave., N. W., Bethesda, Md.

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Sportfishing Regulations and Law Digest, 1959, 31 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento, Calif.

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"Survey of Saskatchewan Fisheries," by J. E. Steen, article, Trade News, vol. 12, no. 5, November 1959, pp. 3-5, illus., processed. Director of Information and Educational Service, Department of Fisheries, Ottawa, Canada. A detailed discussion of the fisheries of Saskatchewan, the third largest fresh-water fishery in Canada. In 1958, more than 11 million pounds of fish, with a record market value of C$2 million, were landed in the waters of this western province. According to the author, the accelerated demand for fish in the United States is chiefly responsible for the increase in production in recent years. About 75 percent of Saskatchewan's catch is exported to the U. S.--only about 10 percent is consumed locally and the remainder is sold to other Canadian markets. Nearly 135 lakes in the province are fished commercially, with whitefish the principal species landed. Problems of transportation have been the chief difficulty in marketing the province's fish. Shipping by air in recent years has helped to solve these problems. The province's fisheries are administered by the Fisheries Branch of the Saskatchewan Department of Natural Resources. The Branch has aided the industry by such work as encouraging the development of mink ranches near lakes, control of carp, and the introduction of new and more commercially-valuable species into provincial waters.

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Vedas y Otras Disposiciones Referentes a Pesca y Caza (Seasons and Other Requirements Pertaining to Fishing and Hunting), 15 pp., illus., printed in Spanish. Ministerio de Agricultura, Direccion General de Produccion Agraria y Pesquera, Valparaiso, Chile. Instructions for officials responsible for enforcing the laws and regulations of fishing and hunting.

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The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have not been published on a sale basis, but have been processed

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Where Does the Shoreline Begin,? by Frederick A. Kalber, Jr., 3 pp., illus., printed. (Reprinted from Delaware Conservationist, Summer 1959, pp. 4-6.) Board of Game and Fish Commissioners, Dover, Del.

GERMAN FEDERAL REPUBLIC:

Jahresbericht uber die Deutsche Fischwirtschaft, 1958 (Yearbook of the German Fisheries, 1958), 307 pp., illus., printed in German with summaries in English, DM 25 (about US$5.98). Verlag Gebr. Mann, Berlin, Germany, October 1959. A review covering all phases of the German fisheries in 1958. Each chapter is followed by a summary in English and all statistical tabulations have English subcaptions. Issued by the Ministry of Food, Agriculture, and Forestry which includes the Fisheries Directorate. Part I contains information on fishery policy in 1958, the United Nations Conference on the Law of the Sea, landings, the fishing fleet, and consumption of fishery products. Part II includes information on cruises of the fishery protection vessels and fishery research vessel, the vocational seamen's association, the work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part III presents data on the German deep-sea fishery in 1958, the lugger herring fishery, cutter deep-sea and coastal fisheries, fresh-water fisheries, the fish processing industry, publicity campaign for seafish in 1958/59, promotion of fish marketing, and elasticities in the demand for fishery products. Part IV, included in the yearbook for the first time, gives data on foreign fisheries and whaling.

HADDOCK:

The Planktonic Stages of the Haddock in Scottish Waters, by Alan Saville, Scottish Home Department, Marine Research No. 3, 23 pp., illus., printed, 7s. 6d. (about US$1.05). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1959.

INTERNATIONAL COMMISSIONS:

International Fisheries Convention of 1946, The Permanent Commission Report by the President on the Seventh Meeting (held in Dublin, November 1958), 35 pp., processed in French and English. Office of the Permanent Commission, Rm. 419, 3 Whitehall Place, London, S. W. 1, England, 1959. Proceedings of the Seventh Meeting of the Permanent Commission held at Dublin from November 25 through 28, 1958. Includes, among other topics, discussion of application of the present mesh provisions; reports from the liaison committee of the International Council for the Exploration of the Sea; proposal to increase the mesh size in trawl nets in the northeastern part of the Convention area; amendment of Article 7(2) of the Convention (use of cod-end covers); report by the Infractions Committee; request for contribution by the Permanent Commission to the funds of the Internation-

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al Council for the Exploration of the Sea; and relations with other international organizations.

(International North Pacific Fisheries Commission) Annual Report for the Year 1958, 123 pp., illus., printed. International North Pacific Fisheries Commission, 6640 N. W. Marine Drive, Vancouver 8, B. C., Canada, 1959. This is the fifth consecutive annual report issued by the Commission since it was established by Convention between Canada, Japan, and the United States on June 12, 1953. It consists of three parts: a report of accomplishments of the Commission's annual meeting, held in Tokyo from November 4 through 10, 1958; a summary of administrative activities during the previous year; and progress reports on research conducted by the member governments under the Commission's program. For the first five years of operation of the Commission, abstention from fishing by certain contracting parties on the salmon, halibut, and herring stocks of the eastern North Pacific was operative without necessity of an annual determination as to continued qualification of the stocks originally specified. At the 1958 Annual Meeting, however, the Commission undertook a review of the qualification of stocks in question for continued abstention. No recommendation for a change in the stocks under abstention was made. Progress in research on the salmon questions raised by the Protocol has been outstanding. Knowledge of the distribution and intermingling of the several salmon species from the two continents is increasing steadily, although quantitative data on intermingling is meager. The great extent of the area of intermingling and the many complexities of intermingling by species and by time make the problem of confirming or changing the provisional line, in order to divide more equitably the salmon stocks from Asia and North America, a difficult one. Studies of the stock of king crab of the eastern Bering Sea were continued by Japanese and United States scientists. Research has not yet progressed sufficiently, however, to indicate whether or not joint conservation measures are required.

IRRADIATION PRESERVATION:

Proceedings of the International Conference on the Preservation of Foods by Ionizing Radiations, July 27-30, 1959, 294 pp., illus., processed. Department of Food Technology, Massachusetts Institute of Technology, Cambridge 39, Mass. Includes the Conference program, panel participants, foreign delegates, and list of observers, as well as the speeches and papers read during the Conference. While none of the papers deals directly with irradiation of fishery products, all are of vital interest to fishery technologists as well as industry members. Probably most pertinent are those papers on: "General Considerations Relating to Food Irradiation," by Bernard E. Proctor; "Direct and Indirect Effects of Radiations," by Samuel A. Goldblith; "A Program for the Evaluation of the Possible Toxicity of Irradiated Foods," by Irvin C. Plough; and "The Effects of Ionizing Radiations on the Nutritive Value of Foods," by Merrill S. Read.

ISRAEL:

Fishermen's Bulletin, vol. 3, no. 1 (21), September 1959, 28 pp., illus., printed in Hebrew with English abstracts. Fishermen's Bulletin, P. O. Box 699, Haifa, Israel. Includes, among others, these articles: "Trawl Boat Expenses in Foreign Currency," by M. Kramer and S. Lipstadt; "Savings Gear Experiments with Trawl Nets (1958-59)," by E. Gottlieb; and "Trawler and Trawl in Action, III," by M. Ben-Yami.

JAPAN:

Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 4, August 1959, 92 pp., illus., printed in Japanese with English summaries. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Minato-ku, Tokyo, Japan. Contains, among others, these articles: "Fishing Conditions for Squid off the Oki Islands. III--Effect of the Surface Current on Formation of Fishing Grounds," by Shumpei Kojima; "On the Spawning of the Ayu, Plecoglossus altivelis T. & S. I--Structure of the Spawning Shoal and Spawning Behaviour," by Rikizo Ishida; "Studies on the Discoloration in Fish Meat During Freezing Storage. II--A Spectrophotometric Method for the Simultaneous Determination of Ferrous and Ferric Forms of Myoglobin in Tuna Meat," by Yoshihiko Sano, Kanehisa Hashimoto, and Fumio Matsuura; "Effectiveness of Dip in Iced Chlortetracycline (CTC)-Containing Sea Water on Keeping Quality of Mackerel Aboard Ship and Determination of CTC Residue on the Fish," by Tetuo Tomiyama and Yasuo Yone; "Gas Content of the Blood in Response to that of Medium Water in Fish. II--Comparison of the Responses in Several Species," by Yasuo Itazawa; and "Change of Free Amino Acids During the Manufacturing Process of 'Katsuwobushi' (Dried Bonito)," by Shoji Konosu and Yoshiro Hashimoto.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 5, September 1959, 83 pp., illus., printed in Japanese with English summaries. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Minato-ku, Tokyo, Japan. Includes, among others, articles on: "Studies on the Estimate of the Distribution Density of Salmon Population on the High Seas," by Kisaburo Taguchi; "The Measurements of Tension on the Salmon Drift Net. I," by Yasusi Kondo and Makoto Suzuki; "Studies on the Method for Testing the Spoilage of Food. X--Errors Involved in Ota's Method for Determination of Histamine," by Atsushi Tsuda, Kenji Mori, and Tetuo Tomiyama; "On the Browning of of Dried Fish Products," by Chiaki Koizumi, Soichi Kurobe, and Junsaku Nonaka; "Studies on the Influence of Treatments Immediately After Catching upon the Quality of Fish Flesh. I--Examinations on Killing and Storing Methods for Keeping Quality of Mackerel, Dace, and Carp," by Yasuhiko Tsuchiya and others; "Studies on the Influence of Treatments Immediately After Catching Upon the Quality of Fish Flesh. II--Further Examinations of Treatments on Keeping Quality of Fish," by Yasuhiko Tsuchiya and others; "Studies on the Influence of Treatments Immediately After Catch-

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ing upon the Quality of Fish Flesh. III--Effect of Several Treatments on Keeping Quality of Bass Meat," by Yasuhiko Tsuchiya and others; and "Studies on the Proteinase of Pyloric Caeca. II--Preparation of Crystalline Proteinase of Tunny Pyloric Caeca by Ion Exchange Resin," by Yoshihisa Togasawa and Teizo Katsumata.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 6, October 1959, 98 pp., illus., printed in Japanese with English summaries. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Minato-ku, Tokyo, Japan. Includes, among others, these articles: "Studies on the Kinematic Behaviour of the Ground Rope of the Trawl Net. I," by Tasae Kawakami and Otohiko Suzuki; "Annual and Monthly Variation of Fishing Condition and Distribution of Yellowfin Tuna in the Arabian Sea," by Jun Nakagome; "Annual and Monthly Variation of Fishing Condition and Distribution of Black Marlin in the Arabian Sea," by Jun Nakagome; "Studies on Movements of Albacore Fishing Grounds in the North West Pacific Ocean. II--Influence of Fluctuations of the Oceanographical Conditions upon the Migration and Distribution (Pattern) of Albacore in the Winter-Summer Period and Its Fishing Grounds in Southern Waters Off Japan," by Motoo Inoue; "Enhancing Effect of Starch on Jelly Strength of Fish Meat Jelly. III--Model Experiments with Synthetic Resin Particles," by Minoru Okada and Atsuko Yamazaki; "Enhancing Effect of Starch on Jelly Strength of Fish Meat Jelly. IV--Relation between Properties of Starch and Reinforcing Ability," by Minoru Okada and Atsuko Yamazaki; "Enhancing Effect of Starch on Jelly Strength of Fish Meat Jelly. V--Application of Modified Starch to Kamaboko Manufacture," by Minoru Okada and Atsuko Yamazaki; "Studies on the Method for Testing the Spoilage of Food. XI--A New Method for Determination of Histamine in Tissues," by Atsushi Tsuda and Tetuo Tomiyama; "Comparative Studies on Two Hemoglobins of Salmon. II--Crystallization and Some Physical Properties," by Kanehisa Hashimoto and Fumio Matsuura; "Studies on the Proteinase of Pyloric Caeca. III--Preparation of Crystalline Proteinase of Bonito Pyloric Caeca," by Yoshihisa Togasawa, Teizo Katsumata and Masashi Ishikawa; "Studies on the Food Poisoning Associated with Putrefaction of Marine Products. VIII--Distribution of 1-(-)-Histidine Decarboxylase among Proteus Organisms and the Specificity of Decarboxylating Activity with Washed Cell Suspension of Proteus morganii with Special Reference to the pH," by Toshiharu Kawabata and Shigeru Suzuki; and "Studies on the Food Poisoning Associated with Putrefaction of Marine Products. IX--Factors Affecting the Formation of 1-(-)-Histidine Decarboxylase by Proteus morganii," by Toshiharu Kawabata and Shigeru Suzuki.

LAKE TANGANYIKA:

Note sur la Peche au Ndagala au Lac Tanganika (Note on the Ndagala Fishery of Lake Tanganyika), by A. Collart, 16 pp., illus., printed in French. (Reprinted from Bulletin Agricole du Congo Belge, vol. 47, no. 4, 1956.) Direction de l'Agriculture des Forets et de l'Elevage, 7, Place Royale, Brussels, Belgium, 1956.

Peche Artisanale et Peche Industrielle au Lac Tanganika (Traditional Fishery and Industrial Fishery of Lake Tanganyika), by A. Collart, 100 pp., illus., printed in French. Direction de l'Agriculture des Forets et de l'Elevage, 7, Place Royale, Brussels, Belgium, 1958.

LEGISLATION:

State Boat Act, 11 pp., printed. (Reprinted from Suggested State Legislation--Program for 1959, pp. 53-63.) The Council of State Governments, 1313 East 60th St., Chicago 37, Ill. Describes a model code developed by the Committee on Suggested State Legislation of the Council of State Governments. This code is designed to complement Public Law 85-911, which provides that after April 1, 1960, all motorboats not having marine documents from the U. S. Bureau of Customs must be numbered for purposes of identification.

MACKEREL:

"O Priniatii Mer po Prekrashcheniiu Vylova Molodi Stavridy, Trachurus" (On Measures of Ending the Catching of Young Mackerel), by Iu. P. Zaitsev, article, Rybnoe Khoziaistvo, no. 4, April 1958, pp. 12-13, printed in Russian. Rybnoe Khoziaistvo, Four Continent Book Corporation, 822 Broadway, New York 3, N. Y.

"Sezonnye Izmeneniia V Promysle Stavridy, Trachurus, V Chernom More" (Seasonal Changes in the Mackerel Fishery in the Black Sea), by T. G. Liubimova, article, Rybnoe Khoziaistvo, no. 5, May 1958, pp. 13-15, printed in Russian. Rybnoe Khoziaistvo, Four Continent Book Corporation, 822 Broadway, New York 3, N. Y. The large mackerel fishery in the Black Sea was organized in 1953. During the past five years there have been explorations, surveys, and checks on the distribution, feeding, and nursery grounds, migration, and catching techniques. Analysis showed that between 1954-1957 hauls have diminished to half. The entire life cycle of large mackerel proceeds within the boundary of the Black Sea. In spring, mackerel migrate to northern Caucasus and to the Crimea sections for spawning. During their advance toward the northwestern part of the Sea, mackerel feed intensively, often stopping for a long time to devour large groups of anchovy. While spawning, in June-July, mackerel keep in small groups, and landings are light. After spawning, mackerel go to the shore area in the southeastern part of the Sea. Here mackerel are caught in drop nets. For the winter, the fish migrate to Anatolii Beach. Records show that Black Sea mackerel have been found to be from 2-13 years of age and in sizes of 25-44 cm. Between 1949-1957, small mackerel completely disappeared. Older and larger fish, from six years and over, predominate, and in the past few years their sizes have been from 30-48 cm. This accounts for the shift and maximum catches during the spring and summer months. Since older groups of mackerel remain on the

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feeding grounds for a shorter period and migrate earlier for the winter, the fall fishery in the Caucasus has diminished. Efforts are being directed now to concentrate the catching and utilization of mackerel during their spring migration.

MARKETING:

Sales Contests for Wholesalers, by Henry D. Ostberg, Small Marketers Aids No. 47, August 1959, 4 pp., illus., printed. Small Business Administration, Washington 25, D. C. Practical suggestions for sales contests are presented. A well-planned contest can boost the salesmen's morale as well as increase the firm's sales. The five steps, outlined in this leaflet, that are involved in setting up a successful contest are: (1) establishing the purpose, (2) deciding on a scoring method, (3) selecting a theme and prizes, (4) promoting, and (5) awarding the prizes.

NUTRITION:

"Nutritional Values and Vitamins of Norwegian Fish and Fish Products," by Torleiv Taarland and others, article, Tidsskrift for Hermetikindustri, vol. 44, 1958, pp. 405-412. Tidsskrift for Hermetikindustri, Stavanger, Norway.

OCEANOGRAPHY:

Annual Report of the Oceanographic Institute, Fiscal Year 1958-1959, 20 pp., processed. The Oceanographic Institute, Florida State University, Tallahassee, Fla., November 1959. Describes the functions and activities of the Oceanographic Institute during the fiscal year July 1, 1958 to June 30, 1959. Emphasis is placed on research projects completed or currently under way.

PARASITES:

Parasites of the Commercial Shrimps, PENAEUS AZTECUS Ives, P. DUORARUM Burkenroad, and P. SETIFERUS (Linnaeus), by Dwayne Nathaniel Kruse, 22 pp., illus., printed. (Reprinted from Tulane Studies in Zoology, vol. 7, no. 4, October 19, 1959, pp. 123-144.) Florida State University, Oceanographic Institute, Tallahassee, Fla.

PERU:

La Pesca en el Peru en 1958 (Peru's Fishery in 1958), by Javier Iparraguirre Cortez, Serie de Divulgacion Cientifica No. 12, 14 pp., processed in Spanish. Dirreccion de Pesqueria y Caza, Ministerio de Agricultura, Lima, Peru. A statistical report on Peru's fishery in 1958, including data on fish freezing, fish canning, fish meal and oil, production of fish and shellfish by species and ports, volume and value of fishery products consumed in the city of Lima, national consumption of domestic and imported fish, supplies of fish in the city of Lima, utilization of fish landed, imports of fishery products, exports by type of product and country of destination, and landings of whales.

PORPOISES:

Auditory Perception of Submerged Objects by Porpoises, by W. N. Kellogg, 6 pp., illus., printed. (Reprinted from The Journal of the Acoustical Society of America, vol. 31, no. 1, January 1959, pp. 1-6.) Florida State University, Oceanographic Institute, Tallahassee, Fla.

Echo Ranging in the Porpoise, by W. N. Kellogg, 7 pp., illus., printed. (Reprinted from Science, vol. 128, no. 3330, October 24, 1958, pp. 982-988.) Florida State University, Oceanographic Institute, Tallahassee, Fla. Perception of objects by reflected sound is demonstrated for the first time in marine animals.

QUALITY:

"Improvement in Quality of Iced White Fish--Boxing at Sea and Stowage in Chilled Sea Water," article, Food Investigation 1957, Report of the Food Investigation Board (Great Britain), pp. 6-7, printed. Department of Scientific and Industrial Research, Charles House, 5-11 Regent St., London S. W. 1, England, 1958.

SANITATION:

The Care of the Trawler's Fish, by C. L. Cutting, G. C. Reay, and J. M. Shewan, D. S. I. R. Food Investigation Leaflet No. 3, 14 pp., printed, 9d. (about 10 U. S. cents). Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, 1953.

SEA LIONS:

"Sea Lion Hunt," by Vincent Sollecito, Alaska Sportsman, vol. 26, no. 1, January 1960, pp. 8-11, 42-46, illus., printed. Alaska Sportsman, Alaska-Northwest Publishing Co., Juneau, Alaska. Recounts the trip of the vessel "Arctic Maid" to the islands of southwestern Alaska, in the Kodiak area, to hunt for predatory sea lions. The voyage was financed by the U. S. Fish and Wildlife Service, which supplied three biologists to study these mammals which are considered a menace to the salmon and halibut fisheries. The objectives of the hunt were to determine whether the sea lion population could be cut down, and to find out if the kill would be commercially profitable.

SEA ROBIN:

"The Sea Robin," by Alfred Perlmutter, article, The New York State Conservationist, vol. 14, no. 3, December-January 1959-60, pp. 12-13, illus., printed. New York State Conservation Dept., Arcade Bldg., Albany, N. Y. Describes the sea robin--a neglected food and sport fish. Although the sea robin is covered with bony plates and has sharp spines on the fins, the meat is tender and succulent and has long been prized by some Europeans. A series of photos shows the sea robin "from fantasy to frying pan in six easy steps."

SEA TROUT:

A Contribution to the Biology of the Spotted Weakfish, CYNOSCION NEBULOSUS, (Cuvier), from Northwest Florida, with a Description of the Fishery, by Edward F. Klima and Durbin C. Tabb, Technical Series No. 30, 23 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla. Describes the material and methods used in a study of the spotted sea trout (weakfish), the commercial fishery and landings, the sport fishery, gear selectiv-

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ity, age and growth, spawning, size and age at first maturity, food, and ecology.

SNOOK:
Aspects of the Biology of the Common Snook, CENTROPOMUS UNDECIMALIS (Bloch) of Southwest Florida, by Alfred V. Volpe, Technical Series No. 31, 35 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla., June 1959.

SPAIN:
"Ante la I Asamblea de Cofradias de Pescadores" (Preparations for the First General Assembly of Fishermen's Trade Unions), article, Boletin de Informacion del Sindicato Nacional de la Pesca, no. 13, October 1959, pp. 6-29, illus., printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6a Planta, Madrid, Spain. Presents a summary of preparations for the First Assembly of Spain's Fishermen's Trade Unions, held in Madrid November 24-28, 1959. Explains the establishment of various committees and thereby describes much of the structure of the Spanish fishing industry.

SPANISH MACKEREL:
Aspects of the Biology and the Fishery for Spanish Mackerel, SCOMBEROMORUS MACULATUS (Mitchell), of Southern Florida, by Edward F. Klima, Technical Series No. 27, 37 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla., June 1959. Describes the methods and material used in a study of the Spanish mackerel fishery of Florida, its taxonomy, commercial and sport phases, and gear selectivity. A section on biology discusses an analysis of stomach contents, spawning, size at maturity, and age and growth of the Spanish mackerel.

SPOILAGE:
A Note to the Fishing Skippers Regarding the Factors that Hasten Deterioration of Fish in the Boats at Sea, Circular New Series No. 1, 6 pp., printed. Fisheries Research Board of Canada, Fisheries Experimental Station, Halifax, Nova Scotia, Canada, June 1953.

Spoilage Problems in Fresh Fish Production, by C. H. Castell, Bulletin No. 100, 25 pp., printed. Fisheries Research Board of Canada, Ottawa, Canada.

SURINAM:
L. V. V. in 1957 (1957 Annual Report of Department of Agriculture, Animal Husbandry, and Fisheries), 216 pp., illus., printed in Dutch. Department of Agriculture, Animal Husbandry, and Fisheries, Paramaribo, Surinam. The section of this report covering fisheries includes information on management and organization; production, import, and export of fish and fish products; research; development of the fishery and related information.

TRANSPORTATION:
"The Road Transport of Sea Products," by M. Duclos, article, Revue Generale du Froid, vol. 35, no. 9, September 1958, pp. 863-865, printed in French. Association Francaise du Froid, 129 Boulevard St. Germain, Paris, France.

"Transport of Fresh Fish by Rail: Individual Shipment, Grouping and Ungrouping," by J. B. Verlot, article, Revue Generale du Froid, vol. 35, no. 9, September 1958, pp. 865-868, illus., printed in French. Association Francaise du Froid, 129 Boulevard St. Germain, Paris France.

TROUT:
Tackle Talk and Trout, 18 pp., illus., printed, single copy 50 cents. U. S. Trout Farmers' Association, Box 55, Buhl, Idaho. Describes briefly the four main species of U. S. trout--the rainbow, brook, brown, and native cutthroat. Tells how to catch, care for, and cook trout and presents many helpful illustrations.

U. S. Mountain Trout, 7 pp., illus., printed, single copy 25 cents. U. S. Trout Farmers' Association, Box 55, Buhl, Idaho. A well illustrated handbook describing the handling, cooking, and serving the ever-popular mountain trout.

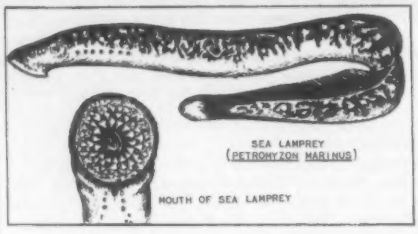
TUNA:
"Le Comité Interprofessionnel du Thon Fixe le Cadre de la Campagne de Pêche à l'Albacore" (The Inter-Professional Committee on Tuna Plans for the Albacore Fishing Season), by L. Plouas, article, La Pêche Maritime, vol. 38, no. 980, November 1959, pp. 675-676, printed in French. La Pêche Maritime, 190, Boulevard Haussmann, Paris, France.

VITAMIN A:
"Isomers of Vitamin A in Fish Liver Oils," by Patricia S. Brown, William P. Blum, and Max H. Stern, article, Nature, vol. 184, no. 4696, October 31, 1959, pp. 1377-1379, illus., printed. Nature, MacMillan & Co., Ltd., St. Martin's St., London W. C. 2, England.

CALIFORNIA LAMPREYS

Three kinds of lampreys are found in California. These are the Pacific lamprey, the brook lamprey, and the river lamprey.

Lampreys are sometimes confused with eels, and are often called "lamprey eels." The true eels are bony fishes. Lampreys may be distinguished from eels and all other true fishes by the possession of a circular sucking mouth without functional jaws, the lack of paired fins, and the presence of seven external gill openings on each side close behind the head instead of the single gill opening of true fishes.



The eggs hatch into a larval form which is blind, toothless and worm-like. A fleshy hood overhangs the mouth.

The Pacific lamprey is the lamprey most commonly seen in its adult form. The adults attain a length of around two feet and average two to three inches in diameter at greatest girth. They are brown, gray, or blackish in color and quite slippery and slimy to the touch. They are common in coastal streams from Southern California to Unalaska, and are most easily observed during spring upstream migrations.

Adults normally migrate upstream from the ocean during the spring and spawn in gravel, excavating a circular depression by removing stones from the nest sites by means of their sucking discs. The adults die after spawning.

The eggs hatch in a few weeks, and the young lampreys burrow into the stream bottoms where they spend their entire larval existence. The young are believed to feed on materials they strain from the oozy materials on the bottom. Although the exact duration of this stage is not known, it is believed to last three to four years.

The larvae grow gradually, reaching a size of up to 10 inches. As they mature, the fleshy hood surrounding the mouth disappears, and the disc-like sucking mouthparts edged with small, sharp teeth develop. The eyes become functional. This form is parasitic and may attach itself to fishes, rasping a hole through the body covering and feeding upon the body fluids.

Such attacks are often lethal to fish under 12 inches in length, which are unable to rub off or otherwise disengage the lampreys. Adult king salmon in the Klamath River often bear lamprey scars or even attached lampreys. However, the fish apparently survive and are little damaged.

The young lampreys usually migrate to the ocean during the winter or spring. In the ocean, the lampreys maintain their parasitic mode of life, attacking various species of fishes. They have even been known to attach themselves to whales, as evidenced by the resulting scars.

The Pacific lamprey appears to be little utilized for food today, probably more due to prejudice than taste. Professor J. O. Snyder, famed ichthyologist, told of eating lampreys cooked over a green willow grate by Indians in Humboldt County, and said that the meat of these lampreys was rich in oil and very good eating. They are also eaten smoked. Here is a new experience awaiting the curious epicure.

One author states, "In atonement for its unsightly appearance and destructive behavior, the lamprey has partly redeemed itself by delighting the appetites of epicures for centuries. History tells us that the wise King Henry I of England did so love the lowly lamprey that he met his inglorious death by eating too many at one sitting."

Lampreys are looked upon with disfavor because of their habit of parasitizing desirable game fishes. Although the amount of mortality the Pacific lamprey causes in fish populations is not known, the occurrence of parasitic lampreys in California is in no manner comparable to the explosive invasion of the Great Lakes by the Atlantic sea lamprey.

The barrier of Niagara Falls originally excluded the Atlantic sea lamprey from most of the Great Lakes (with exception of Lake Ontario). However, when man provided access for shipping through the Welland Canal, he also left an open door for the lamprey.

The situation on the Pacific Coast is entirely different. The parasitic lampreys have inhabited the waters of the area for thousands of years. There is no problem of invasion of virgin areas, and the fish populations are adjusted to their presence.

The Pacific lamprey spends its entire parasitic existence in salt water and, as a rule, does not feed in fresh water. However, in at least three instances, the construction of dams across coastal streams has resulted in the interruption of normal downstream migration of lampreys to the sea.

In such cases, they have heavily parasitized fish present. After several seasons, the lampreys have died off, although a landlocked population is established in Copco Lake, Siskiyou County.

In general, the only means of control presently known is the blocking of adult runs from migration upstream to spawning areas. This is usually accomplished by providing an overhanging lip on a dam, over which the lampreys cannot climb because of loss of suction. Establishment of electrical barriers has likewise been tried in other parts of the country. The development of selective poisons for lamprey control is now in the experimental stage and shows considerable promise.

The brook lamprey is much smaller, averaging about five inches in length. It occurs from Europe through Siberia to Alaska, and thence southward to Central California. In most areas of California, it is less abundant than the Pacific lamprey.

The adults are comparable in size to the larvae of the Pacific lamprey, and the two are not readily distinguished by casual inspection. In general, its life history pattern is believed to be similar to that of the Pacific lamprey, except that it is not parasitic. Upon changing to an adult, it ceases feeding and growing. The teeth become small and dull or fragmented, and the digestive system becomes nonfunctional. This change takes place during late summer or fall, and the winter is passed in this stage.

The following spring, after spawning, death occurs. From the limited knowledge of its life history and habits, it appears to be of little or no economic importance.

The river lamprey is a small parasitic form occurring in the Sacramento-San Joaquin Delta region, San Francisco Bay, and in the Sacramento River upstream at least to Mill Creek, Tehama County. It is the least abundant of the three species found in California. It also occurs in Oregon, Washington and British Columbia. Mature specimens attain an average length of about seven inches. Little is known of its habits or behavior. (Outdoor California, July 1959.)

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"BETTER MEALS" PROMOTION SLATED FOR REPEAT IN 1960

The "Better Meals Build Better Families" promotion introduced for the first time by the Bureau of Advertising of the American Newspaper Publicities Association September 14-26, 1959, is slated for a repeat in 1960. The decision to repeat this promotion was predicated largely on the tremendous support given to last year's campaign.

Here are a few statistics on the 1959 campaign recently released by the sponsors: 973 newspapers with 86 percent of the readership in the United States and Canada tied-in; 350 to 400 newspapers kicked off the event with special sections; 225 newspapers ran special cookbooks; 100 newspapers ran recipe sections; almost all of the cooperating newspapers ran some "Better Meal" recipes; 250 newspapers ran special consumer contests; 175 mayors and many governors proclaimed special "Better Meals" weeks; retailers gave widespread heavy support to the promotion, notably in their use of the "Better Meals" emblem in their advertising; all leading chains, co-ops, and voluntaries tied-in; all major food trade associations endorsed it; and follow-up surveys in 15 representative market areas showed that 62 percent of the consumers recognized and remembered the "Better Meals Build Better Families" slogan.

The U. S. Bureau of Commercial Fisheries tied-in with last year's "Better Meals" promotion through issuance of a special fisheries marketing bulletin as part of its continuing consumer education program in cooperation with the commercial fishing industry. This food-editor bulletin contained six kitchen-tested fish recipes and nutritionally-balanced menus developed by the Bureau's home economists. This bulletin also contained a variety of nutritional facts regarding fishery products. The Bureau expects to issue a tie-in bulletin again this year to assist homemakers in menu planning to "build better families through better meals." The fishery trade can cash-in on the 1960 campaign by building its advertising during this promotional period around the "Better Meals Build Better Families" theme.